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COMMENTS UPON THE U.S.P. INORGANIC CHEMICALS.

By Virgil Coblentz.

Before taking up the work of revision, the first duty that confronted our Committee was the selection of the standard for atomic weights. At that time (Summer of 1900) there was little choice, since the standard of O = 16 had been but recently proposed for general adoption among chemists, and the system of H = 1 had always been employed in previous pharmacopœial revisions. Owing to the fact that the majority of chemists, especially teachers, favored the old standard, and since it was impossible for us to delay our work until this matter was settled, the more conservative plan was adopted in retaining H = 1. After having once entered fully into the task of revision any change was out of the question. Chemists will continue to wrangle over this subject in the future as in the past, possibly by 1910 an agreement may be reached in accepting the O = 16 standard which gives us figures more convenient for practical purposes.

During the last decade, many marked changes in manufacturing processes for the production of various chemicals have been made; this is particularly the case with the alkalies, alkaline earths and acids. Most of these changes are due to the introduction of electrolytic processes which invariably furnish purer products, justifying therefore a raising of the standards of purity of all chemicals derived directly or indirectly from such.

Many of the *general* tests of the old pharmacopœia were unnecessarily sensitive, while others lacked in uniformity of description and application. Further, the requirements for the absence of certain innocuous impurities imposed unnecessary hardships upon

both the manufacturer and consumer. The tests described under many of the chemicals left one in doubt as to the percentage purity required. Therefore, in order to secure uniformity and to avoid misconstruction of the intentions of the text, the Purity Rubric was adopted for all inorganic chemicals. The following represents an outline of the general changes adopted:—

(1) It was resolved to ignore the presence of all innocuous impurities which usually occur in small quantities in medicinal chemicals, so long as the substance otherwise complied with the limits of purity demanded.

For example, the presence of chlorids, sulfates, sodium or calcium in the salts of the alkalies. If a potassium bromid contains of the pure salt 97 per cent., or potassium acetate 98 per cent., or potassium carbonate 94 per cent., it is immaterial, so far as their medicinal uses are concerned, whether they contain these harmless impurities or not.

(2) To drop all flame tests for the presence of *sodium* in potassium salts. This extremely sensitive test demands a degree of purity which is practically unattainable and unnecessary.

(3) To establish the limit of purity of each chemical, which is to be stated (as rubric) in long primer type directly under the title.

(6) To revise the tests (with reference to uniformity and sensitiveness) for the presence of poisonous metals. This is more particularly applicable to those chemicals which are administered frequently and in large doses extending over longer periods of time. For example, such salts as sodium phosphate, the hypophosphites, sulfates, acetates, etc. Furthermore,

(7) *Estimation of Organic Salts of the Alkalies.*—In the estimation of the organic alkali salts, instead of employing a molecular quantity of the chemical as was directed in the U.S.P. 1890, whereby the number of cubic centimeters of volumetric solution consumed represented the percentage purity, an even quantity, namely 1 gramme, has been adopted in the present revision. With the atomic weight system (H = 1) as at present adopted, the former plan was found to be objectionable because in nearly all cases the molecular equivalent weights represent fractions which are impossible to weigh without an accurate analytical balance. For example, sodium acetate 1·351 gramme would require (according to U.S.P., 1890),

9·95 c.c. of N/1 H_2SO_4, or 0·6755 gramme, 9.95 c.c. of N/1 H_2SO_4 corresponding to a 99·5 per cent. salt. If, on the other hand, an even weight, as 1 gramme of the salt (U.S.P., 8th Rev.), which can be weighed with accuracy upon a prescription balance, be taken, we are confronted with the difficulty of measuring fractions of a cubic centimeter. Thus 1 gramme of sodium acetate (99·5 per cent.) should require 14·74 c.c. of N/2 sulfuric acid. Since 1 c.c. pipettes (graduated to hundredths) are cheaper than analytical balances, such fractions of a cubic centimeter can if desired be measured, otherwise the nearest whole number may be accepted. The pharmacopœial text must be accurate and express its standards accordingly, the operator may interpret to suit the case in question.

(8) *Time Limit Test for Metals.*—Referring to the old sulfureted hydrogen test for the presence of undesirable metallic impurities, criticisms have frequently been made of the lack of uniformity in the description and method of application as given in the text of the last revision.

It has been further noted that contrary to analytic procedure, neither *time* nor *temperature* were considered in applying this test for the presence of traces of metals, precautions which are especially necessary in testing for arsenic, which when present in the "ic" condition must first undergo reduction to the "ous" state, before any reaction can take place. It was decided to substitute for this the "time-limit test for the presence of poisonous or undesirable metallic impurities." The limit in this test is intended to be about 1 part in 100,000.

"A solution of the salt or acid in distilled water (1 in 20), when the former is slightly acidulated with an acid, should not be colored or rendered turbid by an equal volume of freshly prepared hydrogen sulphide T. S., after standing well-stoppered in a warm place for at least half an hour, either before or after the addition of ammonia water to slight alkalinity." After the lapse of one-half hour and before the addition of the ammonia water, the mixture should possess the distinct odor of H_2S, if not, it should be thoroughly saturated with the gas and again set aside for half an hour.

(9) *Special Tests for Arsenic.*—The last revision recognized *five* different tests for the presence of arsenic; of these but two were employed in the text proper, namely, the sulfureted hydrogen and Bettendorf's, while the Fleitman, Fleitman-Gatehouse and

Gutzeit tests were given as alternate methods, the latter being intended more particularly for the testing of reagents.

While absolute freedom from arsenic is neither attainable nor desirable, yet under no circumstances should consideration of commercial advantages as to the cheapness or the convenience of manufacturers deter us from guarding most carefully public health and safety. It is conceded by all that arsenic is present in infinitesimal traces in almost every chemical and article of food, hence it remains for us to discriminate between preventive and non-preventive contamination as to the limits permissible. While numerous cases of arsenical poisoning through chemicals and food-stuffs have occurred recently in England, and a repetition in this country is not probable, yet we must not overlook this possibility in important chemicals. As all are aware, this trouble arose through the employment of arsenical pyrites in the manufacture of sulfuric acid. Dr. Hehner (*Jour. Soc. Chem. Ind.*, 1901, 188) has estimated that no less than 1,800 tons of arsenous acid are distributed in the one million tons of sulfuric acid annually produced in England. This acid is employed directly or indirectly in the preparation of all acids and hundreds of chemicals, among which we find glycerin, glucose, borax, boric acid, ferrous sulfate and preparations made from it, sodium phosphate, sodium and potassium carbonate and acetate, phosphorus, phosphates, hypophosphites, etc.

Based on an extensive experience in arsenic testing, Dr. Hehner considers that a sample of sulfuric acid may be considered as dearsenicated if it contains not more than 1 part of arsenous acid (As_2O_3) in 200,000 (0.0005 per cent.) or 0.05 milligramme in 10 grammes. (No difficulty has been found in obtaining samples of acids of American source which withstood the Marsh test for fifteen minutes.)

British chemists have generally agreed upon fixing the limit at 0.001 gramme of As_2O_3, to the gallon for beverages, or pound for foods (*Jour. Soc. Chem. Ind.*, 1901, 193, *et seq.*), corresponding to 1 part in about 450,000.

As to chemicals, the Phar. Br. demands practically entire freedom, which certainly is entirely too stringent when arsenic can be demonstrated to the seventh place of decimals. Dr. Curtman (in the *Pharm. Rundschau*, 1891, p. 175) placed a limit (U.S.P., 1890) of $\frac{1}{100}$ per cent., which would be equivalent to 1 part of arsenous

oxid in 10,000. While this may suffice for all chemicals which are given in moderate doses, yet there are instances in which it is evidently excessive, as, for example, such salts as sodium phosphate, sodium sulfate, acetates, also sulfur, which are usually given in large doses, frequently extending over considerable periods of time.

With the limit set at $\frac{1}{100}$ per cent., or one part in 10,000, in each ounce of these chemicals, about 3 milligrammes, or $\frac{1}{20}$ of a grain, of arsenous acid would be permissible, and considering that some of these are given in doses of from ½ to 2 ounces, frequently repeated, it is apparent that this limit is too low.

Berzelius-Marsh Test.—This test, originally devised by Dr. Marsh, who directed that a cold porcelain surface be held over the burning jet of hydrogen, was modified and improved by Berzelius, in directing the heating of the tube through which the arsine gas passed, for the production of the well-known metallic mirror. The chief difficulties encountered in this test, as well as all others based on the generation of arsine, has been in securing samples of zinc sufficiently pure and free from arsenic, sulfur, phosphorus and iron. At present very pure samples of zinc are readily attainable at a moderate cost. Such zincs contain only *traces* of iron, larger quantities interfere seriously with the test, since iron tends to form an insoluble and undecomposable arsenid. Other criticisms which have been made of this well-known test have been met in the form of apparatus and procedure, so accurately described, even to the minutest details, by the Joint Committee Report of the Society of Chemical Industry and the Society of Public Analysts (*Jour. Soc. Chem. Ind.*, 1902, p. 94). This test as recommended will indicate the presence of 1 part of arsenous oxide in 7,000,000, representing $\frac{1}{1000}$ of a grain per pound or $\frac{1}{100}$ of a grain in one gallon of fluids. O. Hehner states that 0.001 milligramme of As_2O_3 will give a distinct mirror in the tube, in 15 minutes, and this when heated, forms crystals of As_2O_3, which are distinguishable with the naked eye.

The presence of quantities of selenous acid has been found to interfere with the formation of the mirror. This test is too sensitive for general and pharmacopœial purposes.

Gutzeit's Silver Test, U.S.P. (1890).—The delicacy of this test is such that 0.001 milligramme of As_2O_3 will give a faint yellow spot which turns brown on wetting, after having exposed the paper cap, moistened with silver nitrate, to the action of mixed hydrogen and

arsine gases for half an hour. (Flückiger, *Archiv d. Pharm.*, 27, p. 1. Poleck, *ibid.*, p. 3, and Curtman, *Pharm. Rundschau*, 1891, p. 178.) That is, provided all of the arsenic has been converted into arsine. Reichert (Reichert, *Archiv d. Pharm.*, 1880, p. 7) claims the limit to be 0·0014 milligramme, Poleck at 0·006 milligramme, Beckurts (Beckurts, *Jahresberichte d. Pharm.*, 1884, p. 475) at 0·002 milligramme, and Classen at 0·001 milligramme (*Analyt. Chemie*, 1901).

This test is open to serious objections, chiefly due to the extreme sensitive nature of the solution of silver nitrate. These may be summarized as follows:—

(*a*) The presence of sulfur, sulfates, phosphorus or hypophosphites in the reagents or substance to be tested, results in the generation of sulfureted or phosphoreted hydrogen, either of which will produce a black to brown spot like that of arsine.

(*b*) Presence of coal gas or traces of sulfureted hydrogen in the paper or air of the laboratory will likewise produce a dark stain on the paper cap. The same may be said of the presence of dust or the use of a poor quality of filter paper (Curtman, *Rundschau*, 1891, p. 33).

(*c*) The action of pure hydrogen gas for a longer period of time will also cause blackening of the paper cap; this is liable to happen when the reaction is caused to proceed slowly in order to avoid loss of any traces of arsenic probably present. (Flückiger, *Archiv d. Pharm.*, 27, p. 1; also Lohmann, *Pharm. Ztg.*, 1891, p. 748). Another objectionable feature must not be overlooked, and that is the rigid exclusion of the sunlight during the period of testing.

(*d*) Solutions containing antimony produce reactions similar to those of arsenic.

The Modified Gutzeit or Mercuric Chlorid Test.—The substitution of mercuric chlorid for silver nitrate was first proposed by Merçeron and Bergeret (*Comptes Rend.*, 1879, 118) in 1874. The action of arsine on mercuric chlorid had already been studied and found to consist either of the yellow compound $AsH(HgCl)_2$ produced through traces of the gas, or the orange $As(HgCl)_3$ which results from an excess of arsine. In applying this test it is the yellow compound which is ordinarily observed, since the tests are directed only for the presence of traces of arsenic. Alcohol exerts no effect upon this reaction; the test-cap should be dry when the test is applied. Antimony (Stibine SbH_3) produces a dark gray

to brownish black coloration due to the instantaneous decomposition of the compound $Sb(HgCl)_3$ into $SbCl_3$ and Hg_3 which upon moistening with water react with the production of white HgCl and SbOCl. The spot produced by both gases is brown, and if the paper containing this is cut out and immersed in a watch glass containing 80 per cent. alcohol, the antimony spot disappears, while the distinctive bright yellow arsenic spot makes its appearance (Lohman, *Pharm. Ztg.*, 1892, 36). Prolonged action of hydrogen gas results in the production of calomel. This test may be carried out with full exposure to daylight. Any sulfates or sulfites which might be present and reduced to hydrogen sulfid, may be recognized by the blackening of the lead acetate gauze. The only substance which may react similar to arsine, is phosphine (PH_3), produced through the presence of hypophosphorous acid; this is provided against by the preliminary oxidation of the chemical by nitric acid. It will also be noted (U. S. P., p. 322) that *all* chemicals are first subjected to the action of a reducing agent before introducing into the test-apparatus. This is due to the fact that the greater part of the arsenic present in chemicals is in the "*ic*" state, and that the moderate quantities of zinc and acid employed in the test are insufficient to secure complete reduction to "*ous*" arsenic. Tests made by Bird (*Chem. and Druggist*, 1900, 1073), corroborated by the writer, have shown that when 0·05 milligramme of sodium arsen*ate* was tested beside arsen*ous* acid containing the same amount of arsenic, the stain from the former, in 15 minutes, was only about one-fourth of the intensity of that from the latter. Among the various reducing agents employed, sulfurous acid[1] was found to be the least objectionable and most satisfactory. The quantity directed, is completely and readily removed by 15 minutes heating upon the water-bath.

The quantity of zinc and hydrochloric acid (8 per cent.) employed is sufficient to secure a steady evolution of hydrogen for at least half an hour, which will remove all arsenic that may be present in the solution being tested. Pure zinc, as is well known, reacts very

[1] Hydriodic acid answers readily with sodium phosphate, 0.5 gramme of the salt is placed in the test-flask and 20 c.c. of 8 per cent. hydrochloric acid and 1 c.c. of normal potassium iodid solution added. The mixture is heated in a boiling water-bath for five minutes, then quickly cooled to room temperature, the zinc added, etc., as usual. Five minutes heating is sufficient to effect the reduction.

slowly and unsatisfactorily with diluted sulfuric acid, hence the substitution of hydrochloric acid.

The limit of delicacy of this test may be placed at 0.002 milligramme of As_2O_3, this amount produces a faint but distinct yellow stain upon the test-cap.

Bettendorf's Test. U.S.P., p. 466.—The test as recognized in the last edition of the Pharm. Ger., consists in simply adding a concentrated solution of the chemical to be tested to a freshly prepared solution of stannous chlorid in concentrated hydrochloric acid. The employment of the tinfoil, as directed in our last revision, is not advisable, owing to its tendency to cause a reduction of other metals, producing a reaction simulating that of arsenic (Paul and Cownley, *Pharm. Jour. Trans.*, 1893, 431, and Curtman, *Pharm. Rundschau*, 1894, 15.)

To obtain a clear solution of the reagent which will remain clear and colorless on warming and respond readily to the presence of arsenic, it is absolutely necessary that the stannous chlorid be freshly prepared. Commercial stannous chlorid yields a yellow to brownish solution when warmed with hydrochloric acid.

The chief objections that have been offered to this test are:

(*a*) Fails to give evidence with less than 0·1 milligramme As_2O_3 in 1 c.c. The presence of mercury, tellurium and selenium (frequently occurring in acids), which produce reactions simulating those of arsenic. (Dawydon, *Ch. Zeitg.*, 1895, p. 70.)

(*b*) Liability of error, due to deterioration of the stannous chlorid (Geissler, *Pharm. Centh.*, 1895, p. 591.)

The advantages claimed for this reagent are its simplicity of application and adaptability to the detection of arsenic in the presence of antimony. As to delicacy of reaction, Beckurts (Beckurts, *Pharm. Centh.*, 1891, p. 570) gives 0·1 milligramme as the limit, Frerichs (Frerichs, *Apoth. Ztg.*, 1897, p. 176) claims to be able to identify ¾ milligramme of arsenous oxide in one hour's time.

Curtman places the limit at 0·1 milligramme, and states that if after one hour's time no reaction takes place, then less than $\frac{1}{100}$ per cent. of As_2O_3 may be present.

We have found that 0·02 milligramme will produce a very faint brownish tint when viewed by reflected light on a white surface. Comparison should always be made with a solution of the reagent under the same conditions. Sulfates and sulfids should be absent from the chemicals being tested.

Fleitman and F. Gatehouse Test. U.S.P., 7th Rev.—Aside from excluding antimony, these tests offer no advantages whatever over the Gutzeit mercuric chloride and Bettendorf's tests; in fact, they possess all the disadvantages of the old Gutzeit silver test.

One of the chief difficulties encountered with the Fleitman test is to secure a uniform evolution of hydrogen gas, which is so essential in the complete conversion of the arsenous oxide into arsine. The Gatehouse modification offers but little improvement.

Both Hager (Hager, *Ztschr. Analyt. Chemie*, 2, 82) and Clark (Clark, *Jour. Chem. Soc.*, 1893, 884) have pointed out that this test fails if arsenic be present in the "*ic*" state. Curtman states that a scarcely distinguishable reaction takes place with 0.01 milligramme of As_2O_3.

For convenience we may summarize these tests as follows:

Berzelius-Marsh	limit	0.001 mgm.	As_2O_3
Gutzeit Silver	"	0.001 "	"
Gutzeit Mercuric Chlorid	"	0.002 "	"
Bettendorf's	"	0.1 "	"

(*To be continued.*)

STUDIES IN PLANT MUTATION.[1]

By Henry B. Slade.

It has long been recognized that the species of a given family in general have the same or similar chemical principles, that alkaloids hinder the action of enzymes in some cases and aid in others, and that the metabolism of plants, by which the protoplasm continues its activity, is a question of enzymic activity.

This suggests the thesis that changes in form in the plant are due to changes in the metabolic process, induced by the formation of principles which interfere with the normal process, the formation of the principle in turn resulting from the stimulus of a changed

[1] Professor Slade, who was connected with the University of Arizona, and who died in Tucson, Arizona, in June, 1905, left among his papers the unfinished article which we publish at this time. It was the beginning of a very interesting piece of work which, if it could have been finished, gave promise of being far-reaching in its conclusions.

Professor Slade was known to the readers of this *Journal* through his valuable paper on "Some Alkaloids of the Death Camas," published about the time of his death.—Editor.

environment. On the other hand, if the principle formed stimulates the metabolic process, the form may be preserved despite the change of environment. As an experimental test of the action of alkaloids upon the metabolic process, a study of the action of active principles upon plant diastases has been made. The method was to digest 2 c.c. of a water extract of the plant (1 : 10) with 2 c.c. of dilute starch solution and 1 c.c. of a 1 per cent. alkaloid solution (=0·2 per cent. of the mixture) for 15–60 minutes at 30°–40° C., titrating with dilute iodine solution after cooling. The amount of iodine solution needed to produce the same color as the water-control showed comparatively the amount of starch changed to sugar. The results are expressed in percentages of the water control.

Control = 100 . .	Aconitine.	Anemonol.	Morphine.	Berberine.	Strychnine.	Brucine.	Atropine.	Digitalin.	Quinine.	Veratrine.	
Ranunculaceæ:											
Anemone . .	200	66	66	—	66	—	—	66	100	—	
Delphinium .	200	50	75	—	75	—	—	150	100	—	
Fumariaceæ:											
Corydalis . . .	116	—	83	1000	—	—	—	—	—	—	
Papaveraceæ:											
Eschscholtzia	102	—	142	183	58	53	73	73	91	44	
Cruciferæ:											
Sisymbrium .	162	50	98	—	75	54	88	78	85	33	
Liliaceæ:											
Brodiaea . . .	142	—	—	1000	85	85	128	114	114	—	(flower) 16 minutes at 40°
"	1000	—	87	1000	1000	1000	87	62	1000	1000	(flower) 34 minutes at 36°
"	277	—	100	175	175	250	275	225	375	275	(leaf.)

[Anemone contains anemonol; Delphinium, delphinine, very similar to aconitine of Aconitum; Corydalis contains berberine; Eschscholtzia, chelidonine and other alkaloids, possibly morphine; glucosides, yielding oil of mustard, are characteristic of Cruciferæ, and veratrine is the characteristic alkaloid of Liliaceæ; strychnine and brucine come from Strychnos Nux-vomica; atropine from Atropa Belladonna; quinine from Cinchona.]

The preceding table gives the first series of diastase tests made. It here appears that the alkaloid characteristic of a family aids the diastatic activity of the members of that family; thus, aconitine with Ranunculaceæ, berberine with Fumariaceæ, morphine and berberine with Papaveraceæ, veratrine with Liliaceæ.

This favoring action almost appears to run parallel with the natural relation of the family; thus, aconitine and morphine with Ranunculaceæ, Fumariaceæ, and Papaveraceæ.

Alkaloids of distant families retard the diastatic action; thus, strychnine and brucine, atropine, digitalin, quinine, and veratrine. Note that veratrine, which aids with Brodiaea, hinders in the other cases. Digitalin with Delphinium in favoring the action forms an exception. With Brodiaea all the alkaloids appear to aid, an exception to the general rule.

The next table gives some tests on the diastatic activities of several scattered families under the influence of alkaloids.

	Aconitine.	Anemonol	Lupinine.	Strychnine.	Brucine.	Atropine.	Digitalin.	Morphine.	Quinine.
Leguminosæ:									
Astragalus	185	100	333	—	—	—	—	—	—
Lupinus	133	66	—	—	66	66	66	100	33
Calliandra	250	—	466	—	—	—	—	—	—
Plantaginaceæ:									
Plantago	—	—	—	0	—	100	—	—	—
Onagraceæ:									
Œnothera	—	—	—	86	86	111	—	—	—
Malvaceæ:									
Sphæralcea	1000	—	—	1000	1000	—	—	—	1000 (control 1000.)
Geraniaceæ:									
Erodium	77	—	—	100	44	—	77	—	44
Cactaceæ:									
	62	—	—	—	25	—	75	—	—
Compositæ:									
Chaenactis	—	—	—	300	—	—	—	300	500
	Five other specimens tested, but tests unsatisfactory.								
Polygonaceæ:									
Eriogonum	200	—	—	0	0	0	100	—	0

In the foregoing tests the difference in the diastatic activity with the alkaloids according to the family appears marked, an alkaloid hindering in one family, aiding in another.

Lupinine is a principle of Lupinus. Its favoring action in Leguminosæ appears marked, increasing the diastatic activity three and fourfold.

Here, as in the first series, families which vary appear to be hindered in their diastase action by the alkaloids. Note Cruciferæ, Ranunculaceæ, Papaveraceæ, while Brodiaea, which is not apparently variable, is favored by the alkaloids. Sphæralcea is variable but forms an exception here in being favored by the alkaloids. The

composites with their highly developed stable forms are favored, while the species of Cactus is hindered.

The favoring action of aconitine in almost every case, except with Erodium and the Cactus, also appears.

The next series of tests with related groups were with the families included by Engler and Prantl in the Tubuliflorae.

	Strychnine.	Brucine.	Atropine.	Digitalin.	Quinine.	Morphine.	Aconitine.	
Hydrophyllaceæ:								
Phacelia (1)	0	0	0	—	—	—	—	
" (2)	1000	1000	—	1000	1000	—		(control 1000.)
" (3)	1000	106	—	—	—	—		" "
" (4)	1000	1000	—	1000	1000			" "
Polemoniaceæ:								
Gilia (1)	1000	1000	—	—	1000	1000		(control 1000.)
" (2)	1000	1000	—	—	1000	1000		" "
" (3)	1000	1000	—	—	1000	1000		" "
Labiatæ:								
Salvia	1000	100	0	100	100	—	100	
Solanaceæ:								
Quincula	120	113	26	—	—	—		
Scrophulariaceæ:								
Pentstemon	25	25	75	175	50	100	275	
Verbenaceæ:								
Verbena	1000	1000	1000	75	125	—	1000	
Borraginaceæ:								
Amsinckia	1000	1000	100	100	166	—	1000	
Cryptanthe	1000	1000	100	100	1000	—	1000	

With Gilia and Phacelia, in the seven species tried, the activity of the extracts makes any comparison of the effect of the alkaloids impossible.

With the others of this group the favoring action of strychnine and, in a less degree, of brucine is marked.

The hindering action of atropine, an alkaloid of the Solanaceæ, with Quincula forms the only exception to the rule that the alkaloid of a family favors the diastase action of the species of that family, and Quincula is exceedingly variable.

Atropine aids with Verbena and inhibits with the closely related Salvia, while with the Borages it is indifferent.

The 31 species tested, representing 24 genera and 20 families, show conclusively that the action of alkaloids with the diastase varies according to the alkaloid and the family. The tests, fragmentary and

representing a single trial in most cases, indicate that the action of the alkaloid favors a constant form and hinders a variable form, and that in general the principle of a family aids the diastatic action of species of that family.

On the basis of the preceding results germination tests were started with the thought that strychnine in aiding the diastatic activity of Solanaceæ also stimulates the germination of the seeds of that family.

Schizanthus, 100 seeds.	After 38 hrs.	48 hrs.	64 hrs.	81 hrs.	109 hrs.	128 hrs.
Water control . . .	18	26	38	47	58	
Brucine, 0·2% . . .	3	5	7	14	16	
Strychnine, 0·2% . .	23	19	35	57	65	
Scopolamine, 0·1% .	7	9	16	23	23	
Atropine, 0·2% . . .	1	6	13	26	33	
Hyoscyamine, 0·1%	5	?	6	8	8	11

Strychnine appears to slightly better advantage than water control.

Tomato, 100 seeds.	38 hrs.	48 hrs.	64 hrs.	81 hrs.	104 hrs.	128 hrs.
Water control . . .	0	3	45	74	87	
Brucine	0	0	4	38	80	
Strychnine	0	40	77	85	90	
Scopolamine	0	5	46	70	85	
Atropine	0	0	34	89	87	
Hyoscyamine . . .	0	3	16	53	53	89

Stimulating effect of strychnine clearly evident.

Egg-plant, 100 seeds.	38 hrs.	48 hrs.	64 hrs.	81 hrs.	109 hrs.
Water control . . .	0	0	0	0	discarded
Brucine	0	0	0	3	10
Strychnine	0	0	1	19	37
Scopolamine	0	0	0	0	discarded
Atropine	0	0	0	13	24
Hyoscyamine . . .	0	0	2	4	13

Mould in every case, but effect of strychnine still apparent.

Red pepper, 100 seeds.—Germinations after 109 hours.	109 hrs.	128 hrs.
Water control	0	0
Brucine	0	0
Strychnine	0	0
Scopolamine	7	7
Atropine	4	4
Hyoscyamine	8	8

Scopolamine, hyoscyamine, and atropine are all alkaloids of Atropa Belladonna. Hyoscyamine and scopolamine aid; atropine in less degree.

Ipomœa, 26 seeds.	After 38 hrs.	48 hrs.	64 hrs.	81 hrs.	109 hrs.
Water control	0	0	0	1	2
Brucine	0	0	0	0	0
Strychnine	0	1	2	2	2
Scopolamine	0	0	1	1	5
Atropine	0	0	0	0	1

Scopolamine aids most—20 per cent. of total as against 8 per cent. with control.

Petunia, 100 seeds.	After 38 hrs.	48 hrs.	64 hrs.	81 hrs.	109 hrs.
Water control	0	0	0	2	12
Brucine	0	0	0	8	23
Strychnine	0	0	2	5	11
Scopolamine	0	0	3	11	15
Atropine	0	0	7	17	27
Hyoscyamine	0	0	0	1	8

Atropine favors germination; brucine almost as much.

Digitalis.—Only one of five species of Scrophulariaceæ tested to germinate.

	After 109 hours.
Water control	42
Brucine	5
Strychnine	60
Scopolamine	0
Atropine	7
Hyoscyamine	0

Cobæa scandens—only 3 seeds in each test and not sufficient for conclusions.

Brucine 2, strychnine 2, and atropine 1, have germinated before water control.

Verbena, 50 seeds.—Water control discarded on account of mould after 81 hours. All were more or less mouldy. The results were as follows, when control was discarded:

	After 64 hrs.	81 hrs.	109 hrs.
Water control	0	0	discarded
Brucine	0	0	0
Strychnine	0	1	5
Scopolamine	0	0	8
Atropine	0	2	7
Hyoscyamine	0	0	4

SUMMARY.

Aided by strychnine	Schizanthus, Tomato, Egg plant, Digitalis.
Brucine	Petunia.
Atropine	Petunia, Ipomœa.
Hyoscyamine	Red pepper,
Scopolamine	Ipomœa.

A specific favoring action of alkaloids for each species is indicated.

The results with strychnine in general accord with the diastase tests.

ADDENDUM.

Several species have been tested as to the action of alkaloids upon the oxidase. The intensity of the blue color with guaiac with the same dilution showed whether the alkaloid hindered, aided, or was indifferent. In general the alkaloids which favored the diastatic action hindered the oxidase.

Brucine appeared especially injurious to the action of the oxidase, and strychnine almost equally so in the very species where the alkaloids favored the action of the diastase. On the contrary, principles injuring the diastatic action, as anemonol, aided the oxidase action. In a number of species examined oxidases appeared very active in Gilia, Quincula, Sphæralcea, and other variable species, as certain Cacti, while Anemone, Delphinium, and species containing active principles gave little or no oxidase reaction. Alkaloids aid oxidation and it is possible that in plants lacking in oxidases the alkaloid renders more efficient the oxydizing capacity of the vegetable cell.

LONDON BOTANIC GARDENS.

By Pierre Élie Félix Perrédès, B.Sc., F.L.S.,
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A Contribution from the Wellcome Research Laboratories, London.

(*Continued from p. 280.*)

The description of the present collections will be dealt with in the next section, but before passing on to this we will consider very briefly some of the more noteworthy publications which have been mentioned in the preceding pages. The majority of these, as one would expect, were expressly designed for the use of students. The following, for instance, are all embraced in that category: Dale's *Pharmacologia*, Joseph Miller's *Botanicum Officinale*, the catalogues of Philip Miller and Isaac Rand, Philip Miller's "Short Introduction to the Knowledge of the Science of Botany," Curtis's "Linnæus's System of Botany" and his "Lectures on Botany," J. L. Wheeler's catalogue, and Lindley's *Flora Medica*. But Philip Miller's "Gar-

deners Dictionary," Hudson's *Flora Anglica*, and Curtis's *Flora Londinensis* take rank among the classics of English botany, while the last named author's "Botanical Magazine" and Lindley and Moore's "Treasury of Botany" are standard works of reference to this day. These by no means exhaust the list of publications issued by workers who were, at one time or the other, connected with the Chelsea Garden—the list of Lindley's published works, for instance, occupies twelve pages of the folio catalogue of the Library of the British Museum—but they are the most germane to our subject, and comprise all that we shall be able to consider here.

Dale's *Pharmacologia*, or to give it its full title, *Samuelis Dalei Pharmacologia, seu manuductio ad Materiam Medicam: in qua Medicamenta Officinalia Simplicia, hoc est Mineralia, Vegetabilia, Animalia eorumque partes in Medicinæ Officinis usitata, in Methodum naturalem digesta succincte & accurate describuntur*, was first published in 1693 in a duodecimo volume, and went through several editions "both in this country and in foreign parts." The *Tertia Editio* (fourth British issue) appeared in quarto in 1737. Dale's work is written in Latin, but an English name is appended to each substance, and an *Index Anglo-latinus in quo Nomina Anglica Latinis præponuntur, ordine alphabetico*, is added at the end of the book "*in gratiam Tyronum;*" in the *Liber Secundus*, "*De Plantis Medicamentosis*," Ray's system is used *in toto*.[1] The great merit of the *Pharmacologia* lies in the

[1] Semple states, in his revision of Field's "Memoirs" (p. 65), that the system of Tournefort is adopted in the third edition of Dale's *Pharmacologia*, but this statement is without foundation. Pulteney quite correctly says that "the arrangement of the work is that of Ray," and Dale himself, in the preface to his work, specifies his reasons for following this course in the following words:

"Præter Objectiones contra hunc nostrum Laborem, quæ supra in hac Præfatione refelluntur, restant & aliæ quædam, quibus obviam ire hoc in loco necesse duxi. . . . Deindè, me stirpes ad *Raianam Methodum*, quæ à paucis intelligitur, disposuisse dicunt. Cum verò brevitati semper consului, satiùs duxi methodum talem instituere, qua singulas ejusdem herbæ partes simul tractare possem, neque eadem sæpius repeterem, ut necesse esset, si veterem Radicum, Corticum, Herbarum, Seminum, &c., methodum, vel vires medicas secutus essem, uti ab aliis factum est. Hoc quidem caveri potuisset, si ordine Elementari omnia distribuissem; tunc verò Vegetabilia, aliaque congenera separata fuissent, quæ legibus Physicis uniuntur; & Lectori Philosophico, tanquam memoriæ ancilla, aptius hæ accommodantur leges: Et ut verum fatear, inter varias recentes Plantarum methodos intra paucos annos editas, *Raianam*, ut naturæ magis consentaneam, cæteris semper anteposui." *Præfatio*, p. vii.

fact that it is free from the astrological and other absurdities which were rife in publications of a similar nature at that date, and it can therefore be looked upon as the first rational British text-book of materia medica that we possess. Ray, it is true, had paved the way in his writings by casting ridicule upon these old superstitions;[1] but the scope of Ray's works differed essentially from that of the *Pharmacologia*, for whereas Ray treats of plants in general, and only refers in a casual way to the properties of such plants as are used in medicine, Dale, in the *Liber Secundus* of his work deals particularly with medicinal plants and their products. The copious and accurate synonymy and the conciseness of Dale's *Pharmacologia* will best be demonstrated by quoting a portion of one of his monographs, and, for this purpose, we will select the first part of the monograph on gentian, relating to the plant which yields the gentian root of the pharmacopœias:

III. *DE GENTIANA.*

Notae sunt, Folia nervosa, in caulibus ex adverso bina; flores calathoides, margine in lacinias aliquot totidem folia imitantes plerumque diviso; sapor amarus, Raii Synop. p. 102.

A. 1. Gentiana, *Offic. Chab.* 503. Gentiana major, *Ger.* 351. *Emac.* 432. *Raii. Hist.* i. 716. Gentiana major lutea, *C. B. Pin.* 187. *Tourn. Inst.* 80. *Elem. Bot.* 96. *Boerh. Ind.* A. 204. *Hist. Oxon.* iii. 484. *Park. Parad.* 350. Gentiana vulgaris major. Ellebori albi folio, *J. B.* iii. 520. **Gentian.** In hortis curiosorum. Junio floret. *Usu.* Radix oblonga, crassa, foris fusca, intus ex flavo rufescens, saporis intensè amari. *Vires.* Alexipharmaca est; aperit, attenuat. Usus præcipui in peste, aliisque venenatis affectibus; in obstructione hepatis, lienis, &c. *Schrod.*

The reader has only to compare this abstract with the interminable descriptions of Parkinson[2] or the verbiage of William Coles to appreciate the great advance that it represents.

Just as Dale's *Pharmacologia* may be looked upon as our first rational text-book of Materia Medica, so may Joseph Miller's

[1] Take, for instance, the following remarks by Ray in his *Historia Plantarum*, Tom. I, p. 46: "Signaturas præcipuè crepant Chymistæ. Chymicum autem dudum definivit Davisonus ut memini (quàm rectè ipse viderit) *Animal credulum & mendax.*

"Nos alibi Signaturas rejecimus, nec ullas notas naturæ consilio plantis impressas ut naturalium facultatum indices essent, demonstravimus, nec dum sententiam mutamus, ob rationes ibi adductas, quas hic repetemus."

[His reasons are then given, under seven heads.]

[2] The virtues of Gentian as described by Parkinson would fill over two pages of the AMERICAN JOURNAL OF PHARMACY.

"*Botanicum Officinale;* or a Compendious Herbal giving An Account of all such Plants as are now used in the Practice of Physick. With their Descriptions and Virtues" (London, 1722), be regarded as the first text-book of vegetable Materia Medica, worthy of the name, in the English language. Although Joseph Miller's *Botanicum Officinale* is a smaller work than Dale's, it is better adapted to the needs of the beginner, for it is written in English, and in place of Dale's copious synonymy, which is more particularly of value to the advanced student, the author has given longer description of the plants, which he hopes, "*will not be thought too particular, or unnecessary, since they are written with a Design to render this Treatise as informing as possible; and in Order to it,*" he has "*not only consulted Authors of the greatest Name in* Botany," but has "*had Recourse to most of the Simples themselves in their natural Productions. All the Materials are disposed in alphabetical Order, and under the same Names they bear in the* Catalogue of Simples *in the last Edition of the* College Dispensatory, *together with those given them by* Caspar Bauhin, Gerard, *and* Parkinson, *Authors easiest to be met with.*" The following abstract from the *Botanicum Officinale* will show more clearly than any description would do, the difference between the two works:—

Gentiana, Gentian, *Off.* —— *major*, great Felwort, *Ger.* —— *major lutea*, great Gentian, or Felwort, *C. B. Park.*

The Root of the Great Gentian is large, thick, and woody, pretty much divided, of a yellow brown Colour, and a very Bitter Taste; the lower Leaves are pretty long and broad, somewhat roundish, but pointed at the Ends, stiff, and pretty much of the Shape of the Leaves of white Hellebore [compare Plates XIX and XX,[1]], but of a yellow green Colour, with five large Veins on the Back of each. The Stalk arises to be a Yard or more high, having two smaller and shorter Leaves growing opposite at each Joint, which are at some Distance. Among these, on the upper Part of the Stalk, the Flowers grow *verticillatim*, or are set round it; they are monopetalous, or of one Leaf divided almost to the Bottom, into five Segments laid open like a Star, with a green *Umbo* in the Middle, beset with yellow *Stamina* and *Apices*. The Seed is small and brown, growing in longish round Seed-Vessels. It grows wild in the *Alps*, and in several Mountainous Parts of *Germany;* flowering in *July*. The Roots are used.

The virtues are described by Joseph Miller in inverted commas, and, according to Pulteney,[2] they were taken from [one of the earlier

[1] The plant represented on Plate XX is *Veratrum viride*, and not *Veratrum album*, but it will serve just as well.

[2] *Loc. cit.*, Vol. II, p. 103.

editions of] the *Pharmacologia*, but they are inferior to those of the third edition of that work. In the present instance, for example, "Gentian Roots" are described as "hot and dry," but this Aristotelian taint is the only relic left of medieval superstition, and the remainder of the description, which seems to have been originally condensed from Parkinson, is similar to that given by Dale.

The monograph ends with the statement that the "Officinal Preparations are a *Compound Water* and an *Extract*"—information obviously useful to the Apothecary's apprentice.

We have dealt at some length with these two books, as they are of especial interest to the pharmacist, but the remainder of the works on our list must be considered as briefly as possible.

There is little to add to what has already been said on the subject of Philip Miller's and Isaac Rand's catalogues, save that Rand's Index of 1739 is written entirely in Latin, that the arrangement is alphabetical, and that "Ray and Tournefort are the principal authorities referred to."

The scope of J. L. Wheeler's catalogue will be made apparent by the following abstract:—

CLASSIS V.

ORDO II.

PENTANDRIA DIGYNIA.

* *Flores Monopetali inferi.*

GENTIANA. Willd. Spec. Plant. i. 1331. Persoon Syn. i. 284.

ORDO NAT. ROTACEÆ. Linn.

CLASSIS VIII. ORDO XIII. GENTIANÆ. Capsula simplex unilocularis. Juss.

CHAR. GEN. Corolla monopetala. Capsula bivalvis, unilocularis. Receptaculis duobus, longitudinalibus.

* Corollis 5–9 fidis subcampanulatis.

47. GENTIANA LUTEA.

CHAR. SPEC. Foliis latis ovatis nervosis, corollis subquinquefidis rotatis verticillatis. Calycibus spathaceis.

ANGLICE, Gentian.

LOCUS. In alpibus et subalpinis pratis. Perennis.

VIS. Amarissima. Tonica præstans, parum nauseosa.

USUS. In Dyspepsiâ.

COMP. Ext. Gentianæ. *Lond. Edin. Eblan.*[1] Inf. Gent. Comp. *Lond. Edin. Eblan.* Tinct. Gent. Comp. *Lond. Edin. Eblan.* Vinum Gent. Comp. *Edin.*

[1] These refer to the preparations official in the Pharmacopœias of London, Edinburgh, and Dublin respectively, now merged into one: the British Pharmacopœia.

Of Philip Miller's "Short Introduction" to Botany nothing further need be said, but a few words must be spared for Curtis's "Linnæus's System of Botany" and his "Lectures on Botany." Both of these were published after the author had severed his connection with the Chelsea Physic Garden in order to found a school of his own in his garden at Lambeth, and they are chiefly remarkable for the beautifully executed and accurate engravings which they contain. These are printed from copper plates, and are designed to illustrate the terms used in Botany and the divisions of the Linnean System, by means of representations of the living plants.

Lindley's "Flora Medica; a botanical account of all the more important Plants used in Medicine, in different parts of the World" (London, 1838) is a modern text-book in every sense of the word, and it could very advantageously do duty at the present day, with but little alteration. The generic and specific characters are very fully, albeit concisely, given, and the medicinal uses of the plants are admirably summarized. Indeed, in looking through the book one is struck by the fact that the additions which have been made since then to our knowledge of the subject are relatively unimportant. We have, it is true, located the active constituents of many plants, but Lindley does not deal with plant analysis, and the therapeutical properties of the drugs which we use were known in 1838, although their active principles may not have been isolated nor the mechanism of their action on living tissues determined. The *Flora Medica*, however, did not appeal to the class for which it was intended. This was probably due to the fact that there was too much botany in it for the average medical student, while, on the other hand, the botanist capable of appreciating Lindley's work would naturally prefer to consult more comprehensive works on Systematic Botany. But Lindley's labors were not entirely in vain, for the information which he had so laboriously compiled on the medicinal uses of plants was utilized by the medical botanists who contributed to the "Treasury of Botany."

"The Gardeners Dictionary" by Philip Miller was first published in 1724. The first edition in folio appeared in 1731, and the last edition, in four folio half-volumes, was issued in 1807 under the editorship of Thomas Martyn, the then Regius Professor of Botany in the University of Cambridge. Martyn's preface contains a detailed account of all the various editions of Miller's *magnum opus*, and to

this we must refer the reader who is interested in the subject. For nearly a century the "Gardeners Dictionary" was the recognized authority on gardening in this country, and we find Linné saying of it: "*Non erit Lexicon Hortulanorum, sed etiam Botanicorum.*" Miller's work is, therefore, of considerable historical interest at the present day, inasmuch as its several editions reflect the progress of gardening in this country during the period in which they were published. It is of interest to record that in the eighth edition, published in 1768, Miller suggests that certain useful plants "as namely the Safflower, Indigo, and several other sorts used in dyeing, none of which will thrive in this country to advantage, with many medicinal drugs" should be cultivated in the West Indian Possessions. From the account which has already been given of the work of Kew Gardens it will have been noticed that the suggestion put forward by Philip Miller in 1768 was partly acted upon subsequently (see AMERICAN JOURNAL OF PHARMACY, Vol. 78, pp. 73–74). In 1732 Philip Miller published his "Gardeners Kalendar." This little book, which may be looked upon as a supplement to the "Gardeners Dictionary," went through fifteen editions in the author's lifetime, and its principal interest to us lies in the fact that "A List of the Medicinal Plants which may be gather'd in each Month for Use" is added to the ninth edition—a circumstance which would lead us to suppose that the apothecary, in Miller's day, cultivated his own drugs, or, at all events, gathered those which were indigenous.

Hudson's *Flora Anglica* has already been referred to at some length, and it is only necessary to add that it was for many years the standard guide to the flora of this country. The first edition was published in 1768 in one volume, and the second in 1778, in two volumes.

William Curtis's *Flora Londinensis* and "The Botanical Magazine" may be taken together. The beauty and accuracy of the plates, which are reproduced in every case from the living plants, constitute the dominant feature of these two works, as of all Curtis's publications. The *Flora Londinensis* was commenced in 1777, but only six fasciculi were issued, as the subscriptions did not cover expenses. Each fasciculus contains the plates and descriptions of 72 plants growing "wild in the Environs of London," printed on large folio sheets. In the "English Botany" by Sowerby and Smith, which appeared subsequently, the task which Curtis had begun in his

Flora Londinensis was, to some extent, completed, and even extended, but the plates of the former work are not to be compared with those of Curtis's six fasciculi. The first number of "The Botanical Magazine; or Flower-Garden Displayed" was issued in 1787, and the plan of the work, which has been faithfully adhered to in its essentials ever since, is outlined by Curtis in his preface as follows:—

"The present periodical publication owes its commencement to the repeated solicitations of several Ladies and Gentlemen, Subscribers to the Author's BOTANIC GARDEN, who were frequently lamenting the want of a work, which might enable them, not only to acquire a systematic knowledge of the Foreign Plants growing in their gardens, but which might at the same time afford them the best information respecting their culture—in fact, a work, in which Botany and Gardening (so far as relates to the culture of ornamental Plants) or the labour of LINNÆUS and MILLER, might happily be combined.

"In compliance with their wishes, he has endeavoured to present them with the united information of both authors, and to illustrate each by a set of new figures drawn always from the living plant, and coloured as near to nature as the imperfection of colouring will admit.

"He does not mean, however, to confine himself solely to the Plants contained in the highly esteemed works of those luminaries of Botany and Gardening, but shall occasionally introduce new ones, as they may flower in his own garden, or those of the curious in any part of Great-Britain."

After Curtis's death the "Botanical Magazine" was continued by John Sims, who was succeeded by Sir William Hooker, to be followed in turn by Sir Joseph Hooker, and by the present editor, Sir William Dyer. The value of the "Botanical Magazine" to the pharmacist is evidenced by the fact that, in the last edition of the British Pharmacopœia, he is referred to that magazine for plates of the following plants: *Aloe Chinensis*, Baker (*Bot. Mag.*, plate 6301); *Aloe Perryi*, Baker (*Bot. Mag.*, plate 6596); *Erythroxylon Coca*, Lam. (*Bot. Mag.*, plate 7334); *Hamamelis Virginiana*, L. (*Bot. Mag.*, plate 6684); *Illicium verum*, Hook. f. (*Bot. Mag.*, plate 7005); *Pilocarpus Jaborandi*, Holmes (*Bot. Mag.*, plate 7483); *Quillaja saponaria*, Molina (*Bot. Mag.*, plate 7568); and *Smilax ornata*, Hook. f. (*Bot. Mag.*, tab. 7054).

"The Treasury of Botany," edited by Lindley & Moore, is last on our list, but not least. It would be a work of supererogation to describe a book which is so well known to every economic botanist, but it is no exaggeration to say that there is no other work on the same subject which contains so much information compressed into so small a space.

With the "Treasury of Botany" we may fitly close our account of the work accomplished in the Chelsea Physic Garden under the ægis of the Society of Apothecaries. On contemplating these splendid achievements we cannot but experience a feeling of regret that the institution which had been fostered by the Apothecaries for so long a period, at such great sacrifice, should eventually have fallen into decay. It was, however, in the nature of things that this should have resulted, for botanical studies have now been practically divorced from the medical curriculum, and the duties of the Apothecary have been relegated to his successor, the pharmacist.

(*To be concluded.*)

THE FUNCTION OF THE TRUE PHARMACIST.[1]

By Solomon Solis Cohen, M.D.
Professor of Clinical Medicine in the Jefferson Medical College.

Let me congratulate the members of the Philadelphia Branch of the American Pharmaceutical Association on the important step they are taking to restore the practice of pharmacy in Philadelphia to its elder and more fitting status among the learned professions. It seems to me time that a larger and nobler meaning be given to the term "pharmacist." The true pharmacist has a high function to fulfil—a much higher function than drawing soda water or handing out "proprietaries" over the counter. When the physician ceased to collect and prepare the drugs that he administered and turned over to the apothecary that important duty, in order to devote more time to his own special studies of diagnosis, pathology and therapeutics, the apothecary became charged with all the responsibilities concerning medicaments that had theretofore rested upon the physician. In the evolution of science and of art the responsibilities both of physician and of pharmacist have become greater, not less. The individual pharmacist can no more shift these duties upon the wholesaler's or manufacturer's shoulders than I can shift my responsibilities to my individual patient upon the shoulders of Jefferson College, or the County Medical Society, or a medical syndicate organized for commercial purposes. The grocer

[1] Address delivered before the Philadelphia Branch of the American Pharmaceutical Association, March 28, 1906.

or the notion dealer, or the six-dollar clerk in the department store, has sufficient knowledge to take a package from the shelf and hand it to a purchaser, or even to decant a portion of it into another container. To do this requires merely the ability to read a label—or perhaps only to recognize a picture. As a physician I look to my brothers of the pharmaceutical profession for greater knowledge, greater skill and greater assistance than I can get from the grocer's clerk or the errand boy. I am in the habit of consulting with friends in your profession—and I see here some of those who have thus aided me—concerning new drugs introduced from time to time, new uses and new preparations of old drugs, the possiblities of new combinations of drugs, that may have been suggested by the exigencies of a special case, as well as incompatibilities, methods of administration, and other matters in which the physician must in greater or less degree depend upon the special knowledge, training and skill of the pharmacist. In return, I have been complimented by their inquiries on matters concerning which I may have had special information of use to them. There is no reason why this pleasant relation of confidence and mutual assistance should not exist between all physicians and all pharmacists worthy of the name.

Certainly nothing will do more to extend it and to advance the best interests of the profession of pharmacy than the formation of such an association as you are now about to form in Philadelphia, and the determination on the part of practising pharmacists to maintain a high professional level as scientific men and to resist the conversion of their professional standards into trade standards. I do not intend hereby to cast any slur on trade or tradesmen; I honor both and admit the indebtedness of mankind to both; but it is a fact that standards differ. The standard of the fiction-writer is not, or ought not to be, the standard of the medical author and the standard of trade, "buy cheap and sell dear," is not and ought not to be the standard of the practising apothecary. And here I may touch upon a personal and practical matter concerning the ability of the physician to know the pharmacist as distinguished from the drug-and-soap-seller. It is impossible for every physician to know every pharmacist or even to know who is in charge of the prescription desk at a certain drug store. Frequently I am asked "Shall we take this prescription to so-and-so at the corner or shall we take it down-

town?"—or up-town, as the case may be. Now if I can have a list of members of the local branch of the American Pharmaceutical Association, and so-and-so's name appears there, I can be reasonably sure that prescription and patient will be safe in his hands; that, for example, when I prescribe infusion of digitalis he will not thwart my purpose by dispensing a dilution of a fluidextract bought from some wholesaler, but will give a real infusion made from the best leaf obtainable; that when I prescribe an imported crystalline strontium bromide, he will neither fraudulently dispense an impure domestic salt which will make my patient vomit, nor stupidly substitute fluidounces of an imported solution for the solid ounces ordered of imported salt. I am citing only a few of many such instances that have actually happened when my prescriptions have been taken to patent-medicine and perfumery stores masquerading as pharmacies; and you will admit that these instances justify me in the direction to take such a prescription to some definite drug store where I know scientific pharmacy is practised. I prefer that this should be near the patient's home if possible, but sometimes I do not know any such pharmacy in the desired neighborhood. Now the list of your members will help me in this very much, I think, as it will be, so to speak, an "Index of Dependable Druggists."

Do you realize, gentlemen, how much the progress of practical therapeutics lies in your hands? If, because of an impure or imperfect preparation, a drug that I have chosen after considerable thought as the one best adapted to the particular conditions of a special case, fails to give relief, not only the individual patient suffers, but also my professional judgment is misled as to the practical effect of the remedy; and every other patient that comes under my care is to that extent deprived of a possible agency of relief. I am misled also as a teacher and as an author. It is for this reason that when such disappointments happen in cases in which I am reasonably sure of my ground, I say, "Well, here's another prescription; take it to so-and-so." I don't say that the first druggist is at fault; I don't know that. But I determine to give my patient and my science the benefit of the doubt rather than abandon what seems to be the best line of treatment. In chronic cases we can often thus protect ourselves. But how about acute cases, or how about sudden emergencies in chronic cases of heart disease, in which the effect of musk, for instance, may, as I have repeatedly

seen, snatch a patient out of the jaws of death, and in which the dirt commonly dispensed for musk is worse than useless?

A tremendous responsibility rests on the conscientious pharmacist. He is always the active assistant of the physician; he is frequently the path-finder and guide of medical progress in certain directions. Therapeutics, so far as it relates to drugs, must advance in the future through the active and intelligent co-operation of chemistry and biology, of pharmacy and medicine. In such advance I look to this Society confidently for leading and for light.

REMARKS AT THE ORGANIZATION MEETING OF THE PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

By Dr. Henry Beates, Jr.

Being honored with an invitation to be present this evening and listening to the remarks indulged during organization, I made brief notes of a few thoughts that perhaps can be advantageously considered; and the first point desired to be emphasized is that *the very existence of the science and art of pharmacy is determined by the successful practice of medicine*, and the successful practice of medicine depends upon a higher degree of qualification than has ever obtained in the past.

Thus the principal problem confronting the two professions is the same for each, to wit.: the establishment of conditions which *must* result in foundationing a higher standard of qualification. This embodies two conditions, applicable alike to our professions, which have unavoidably and prominently forced themselves upon our attention; and the first is the recognized necessity for the eradication of degenerate commercialism; and the second, the establishment of those conditions which will assure to both the highest standard of qualification.

In medicine, commercial degeneracy manifested itself by prostitution of the degree, and took shape in the morally rotten and unprincipled commercial medical college, which is the undeniable source of that large percentage of illiterate and incompetent practitioners of medicine, and a great public menace of the day, and, in pharmacy, a like prostitution of the output of remedial agencies, by processes which are suicidal to both the science and art of pharmacy and of medicine.

Thus we both, practically, confront one proposition—the extermination of commercialism in its bad sense, because it constitutes the one prominent factor and power which seriously obstructs progress, and postpones the fulfilment of the highest achievements possible to our professions.

It is this concrete fact, viewed from the practical standpoint, which finds this body organizing to-night, and which constitutes a nucleus composed of men of character and integrity, disinterestedly interested in the welfare of man and formed for the purpose which this honorable body has so well expressed. As the huge problem to be solved is contemplated, it may, perhaps, seem almost hopeless, but rest assured, gentlemen, that the time is most opportune for initiatory action in the direction assumed this night to be successfully launched.

The public mind, as the people are being educated, is becoming keenly alive to the importance *to them* of the questions involved! The medical profession is surely emerging from its commercial rottenness, and physicians, competent to fulfil their responsible trusts, are at last being trained, who, in the very near future, will be able to properly formulate and write a prescription, and intelligently and skilfully employ remedial agencies and all necessary means in the treatment of disease. They will also be capable of knowing, as a large percentage now in practice, and because of the above indicated reason, unfortunately do not, whether pharmaceutists correctly compound the medicaments for which a prescription calls, and also whether the patients are taking them.

It is the inability of the profession to recognize these latter points that affords the tempting ground for the unprincipled pharmacist to foist upon the prescribing physician and his patient any and everything, no matter how inert, as well as to substitute, without fear of detection, cheaper and worthless medicaments for those prescribed.

This condition of things, in the future, gentlemen, can no longer obtain! Patent medicines, nostrums, etc., from the higher and intellectual plane briefly outlined, will, by the practitioners soon to be, naturally be discarded. Law will punish the hitherto unbridled fraud and swindle, and, if the commendable initiatory action of this evening flourishes, as it must if properly cultivated, the dealer and seller of these concoctions will be regarded, by the laity as well as the profession, as a living disgrace and menace to the public good.

The members of the two professions we represent who are not in

touch with the progress being made in the work of establishing higher standards of qualification may, perhaps, be surprised to know that the time is not very far distant when it will be possible, because of enlightened public sentiment, to bring to justice those who, directly or indirectly, are identified with the conditions outlined, and who, up to the present, have followed their unprincipled methods with apparent immunity from penalty.

That this condition obtains can, perhaps, be impressed upon you by quoting the official opinion of the Attorney-General of Pennsylvania, to whom I referred a question relating to these matters for his reply. Tersely the opinion resulting from the practices of corporations and from physicians who employ those not licensed to practice medicine, and also from the action of those commercial concerns that foist upon the community products alleged to be a cure for this or that affection, evolved the question whether or not these things (advertising and selling alleged cures for this or that disease) could be done without becoming amenable to the law? This elicited the following reply; after citing the Acts of Assembly governing the practice right: "I am of the opinion that no one, whether acting for himself or under employment by corporation, can practice medicine without a full compliance with all of the requirements laid down by the Acts of Assembly above referred to." These Acts contain penalties for violation of their provisions, which are styled misdemeanor, and upon conviction thereof in the Court of Common Sessions in the proper county an exemplary fine can be imposed. The case put by you differs in no respect from the ordinary cases of practicing medicine without a license.

These advertisements practically profess to cure this or that ill with such and such a concoction. They, therefore, that is the manufacturers themselves, by alleging cures, are undoubtedly acting in the capacity of a physician, *because they offer their services as a physician to cure and care for various diseases, deformities and injuries!* A person who undertakes to do the work of a doctor, which is the treatment of all diseases, does not evade responsibility by any commercial trick or method.

By organizing to-night and establishing an educational centre of such moral force, the object of which is to educate your patrons so that they will be disposed to relinquish the intention of purchasing nostrums and alleged cures, and intelligently pursuing the wiser

course of consulting and profiting by the scientific achievement and skill of properly trained physicians, you will undoubtedly from the narrow point of view only of the money interests involved, found a far more profitable vocation because the narrow margin of profit realized by the sale of this or that concoction will be more than overbalanced, as it properly should be, by the merited remuneration of knowledge and skill; the art, I wish to designate it, of the higher qualified and learned practitioner of each of our professions.

The art of applying means to an end is a factor in practice not appreciated by either the laity or the profession. The use of means to an end is comparable, let me illustrate, by the following crude example: Suppose four of us were sitting about a table, and one challenged the others to balance on the end of his finger a small stick. The means are the same for the four. One, in his endeavor to balance the stick, is lacking greatly in skill, and with much physical effort in his attempt to balance it fails, the stick falling to the table in spite of crude efforts. Another succeeds by the trained and skillful use of the muscles of co-ordination, and quietly maintains the stick in position, as though it were fastened to his finger.

So it is with the art of the practitioner of medicine, and, in a large degree with the practitioner of pharmacy, and it is this ability to successfully do which is to constitute the future basis for legitimate and well-merited compensation; and it is when conditions upon which such skill depends are established, that those acquiring this high standard of achievement will have served the public interests, as well as their own, in the highest possible manner. A conscientious duty will have been well done, and, so far as the duties of our two professions are concerned as factors in the affairs of life, human progress will continue apace.

I congratulate you upon this commendable movement, which must of necessity establish still more firmly that indissoluble bond of union which is natural to the two professions we have the honor and the responsible trust to represent, and by the faithful, sincere and conscientious observance of the great duties reposed, the privilege of exercising the highest possible functions vouchsafed to man, will largely contribute to unparalleled success in its broadest sense.

ELIXIR AROMATICUM.

By William G. Toplis.

The formula for the preparation of Elixir Aromaticum is one of the greatest time-consumers in the United States Pharmacopœia. The continued filtration and refiltration of the product, particularly where considerable quantities are made, requires the prolonged presence of material and apparatus upon the working table, often using space needed for other purposes. This needless sacrifice of time prompted me to seek a short cut in the preparation that would make no sacrifice of its properties, yet expedite its manufacture. As a result of thought and experiment on the subject I submit the following for your consideration:

Take of

Purified talcum	30 gráms.
Comp. sp. orange	12 c.c.
Alcohol	238 c.c.
Distilled water	563 c.c.
Sugar	375 grams.

Mix the comp. sp. of orange with the purified talcum (personally I prefer magnesium carbonate). To this, in a mortar, add gradually the water and alcohol previously mixed after the manner of making medicated waters, transfer to a wetted filter and when the filtrate has passed make it up with distilled water through the filter to measure 818 c.c., then add the sugar and dissolve by agitation, or the sugar may be percolated with the filtrate if preferred. This method makes a clear bright preparation and it may be finished in about 15 minutes up to the addition of the sugar.

PASTING LABELS ON TIN.

By William G. Toplis.

After thirty years of experience with labels curling off from metal surfaces, and after some minutes of careful thought upon the subject, I came to the conclusion that the reason for this undesirable condition was centered in the contracting of the paste, consequent upon its drying. Therefore, I reasoned, that if it were possible to prevent extreme desiccation the label should adhere to metal as well as other surfaces. Accordingly I sought to accomplish this by mixing

glycerin with the paste. The results were indifferent, but encouraging. Finally the idea of applying a coat of pure glycerin to the back of the label suggested itself, and then the problem was solved. The paper absorbs enough glycerin to prevent contraction, yet permits the necessary drying of the adhesive. I find the following a good method to pursue: Keep a convenient supply of glycerin in a wide mouth bottle; when required for use, tilt until glycerin runs into the neck, then return the bottle to a vertical position. It will be found that enough glycerin to moisten the tip of a finger remains within reach. Apply with the finger to the back of the label and immediately paste over it as usual.

ABSTRACTS OF THESES ON CHEMICAL SUBJECTS.[1]

By J. W. Ehman.

Extemporaneous Sulphurous Acid. By F. L. Cheney.—Mr. Cheney made numerous experiments having in view the preparation of extemporaneous sulphurous acid by a process similar to that of compound solution of chlorine.

Experiments were first made by adding a solution of tartaric acid to calcium sulphite and also to potassium sulphite, both of which give difficultly soluble by-products. The calcium and potassium salts obtained in the market were, however, found to be so variable in quality that these were rejected.

Sodium sulphite and bisulphite of approximately U.S.P. strength were treated with hydrochloric acid and the sodium chloride formed left in the solution.

The following formula is recommended as giving, after repeated trials, the best results: Dry acid sodium sulphite, 5·7 grammes; dilute hydrochloric acid, 18·5 c.c.; water, 25 c.c. Add the acid to the salt placed in a fair-sized (8 ounce) glass-stoppered bottle, quickly stopper and set aside in a cool place. Agitate slightly to aid solution of the salt and when effervescence ceases add the water and agitate for a few minutes.

The product should measure 40 c.c. and assay from 6 to 6·5 per cent. SO_2.

Liquor Chlori Compositus. By William R. Shearer.—As a result

[1] The experimental work embodied in these theses was performed in the Chemical Laboratory of the Philadelphia College of Pharmacy.

of experiments and analyses made by himself Mr. Shearer concludes that it is impossible, even under the most favorable conditions, to obtain compound solution of chlorine containing ·4 per cent. Cl as prepared by the U.S.P. formula.

The difficulty appears to lie not with the process itself, but with the insufficient quantities of potassium chlorate and hydrochloric acid directed to be taken.

Analyses of the product were made by adding potassium iodide and dilute sulphuric acid and titrating the liberated iodine with sodium thiosulphate V. S.

Following are the results obtained in eight experiments, the first three being made by U.S.P. quantities and the remainder by varying quantities of acid and chlorate:—

Sample No.	Gms. $KClO_3$	C. C. HCl	Water to make	Per cent. Cl found	
				immediately	after.
1	1.25	4.5	250 c.c.	·1488	29 days ·0914
2	"	"	"	·0943	29 days ·0686
3	"	"	"	·21	21 days ·1134
4	2·5	"	"	·1803	21 days ·1048
5	1·25	6	"	·2801	21 days ·1619
6	1·25	7·5	"	·2962	21 days ·1619
7	1·25	9	"	·3447	21 days ·1134
8	2·50	9	"	·4116	

In view of the fact that the more nearly saturated solutions lose Cl more rapidly than the weak ones, Mr. Shearer suggests making the requirements ·1 per cent. Cl and diluting the stronger preparation to the necessary extent.

It is stated that if a fluid ounce of chlorine water (·4 per cent. Cl) is added to a solution of 14 grains pure ferrous sulphate no blue color will appear upon addition of potassium ferricyanide. A quick assay of chlorine water could thus be made by determining the amount of the preparation required to oxidize the iron salt. Adding the necessary amount of water would then insure a weaker but uniform product.

PROFESSOR WILEY ON FOOD PRESERVATIVES IN NORTH DAKOTA.

By R. G. Eccles, M.D.

In the April issue of the American Journal of Pharmacy Prof. Harvey W. Wiley states that my data concerning the deaths in North Dakota, given before the Interstate Commerce Committee of the House of Representatives, at the last pure food hearing, were shown by Professor Ladd to be "wholly erroneous." While it is far from my desire, or intention, to challenge the words of Professor Wiley, I am nevertheless constrained to call his attention to the fact that in the form in which he uttered them the reverse of what he has said happens to be the truth. Perhaps it was his intention to say that while my data were correct Professor Ladd had challenged the conclusion which I drew from those data. So far was the latter gentleman from showing that my data were either partially or "wholly" erroneous that he acknowledged in a public manner that they were correct, and was frank enough to confess that the last issue of the Report of the Board of Health of his State had even strengthened my facts. What he tried to do was to give what he deemed another explanation of these facts. In a subsequent communication I showed him, by official figures, that his explanation could not possibly be the true one; but up to the present time the journal in which the discussion was conducted has failed to publish the reply.

Immediately following the North Dakota crusade against preservatives the Board of Health Report showed a rise of over 60 per cent. in the number of deaths. This was in 1904. Last year (1905) it was still higher, showing a rise in the two years of 120 per cent. In the city of Berlin, Germany, a similar crusade against preservatives was followed, just as closely, by similar results. The fact that no other State showed any such rise as that of North Dakota, and no other German city such a rise as that of Berlin, coupled with the fact that the only thing of a casual nature that happened to these two places and to no other, was the stringent attack on preservatives, makes but one inference appear to be an adequate explanation. Professor Ladd explained the rise in his State as due to an influx of new emigrants who, settling far away from proper medical attention and pure drinking water, fared badly. Unfortunately for this explanation

there was no larger proportion of new emigrants in 1903 and 1904 than there had been for over ten years before, and while former emigrants had in most instances gone into the country those of the years just preceding and during the experiment went chiefly into the towns and cities. (*Bull. Amer. Geograph. Soc.*, April, 1906, p. 226.) Besides this the N. D. Board of Health Report (1903–1904, p. 89) says that these later emigrants were "very young and prosperous people," and adds, "the climate being exceptionally healthful." The facts are thus shown by official records to be the reverse of what they should be if his explanation was a sound one. It is the invulnerability of these facts that makes partisan journals close up discussions on the subject. It surely was not pioneer life nor bad water that increased the number of deaths so largely and in such a sudden manner in Berlin. If he had shown that the population of North Dakota increased 60 per cent. in 1904 over 1903 and 120 per cent. in the second of the years he would have shown that the death rate was steady. But the increase is shown by the 1905 census to have been but 7·4 per year since 1900. The people had been led to expect better health as a result of the raid, and the deaths were more than doubled. The food had been made a better soil for the cultivation of disease germs.

If Professor Wiley is able to show that his chart of the hygienic relations of foods and drugs is even reasonably probable, there can be no excuse for any person ever using preservatives in foods. It is certainly the most remarkable, and entirely original, contribution to the science of the subject that it has ever been my fortune to come across. What a pity it is that he has never once advanced a single fact in evidence of its merit. He gives it to the world as axiomatic, in exactly the same way as the metaphysicians of a former age used to do with their theologo-mathematical speculations. It would be a great boon to all of us if he would cite an authority or two in physiology, pathology, or toxicology who ever entertained his idea, as expressed in his drawing. It has never been my fortune to discover a physiologist or pharmacologist who could so sharply distinguish between foods and drugs. It is generally believed that no such line exists and that they merge into each other. Never before was so powerful a blow struck at the doctrine of Evolution, providing it is true, and it surely should have been shown to Herbert Spencer before he died. If one single substance can be named,

whether a food or a drug, the properties of which can be shown to correspond with Professor Wiley's chart, my conversion to his faith will be so thorough that the rest of my life will be devoted to undoing all that my efforts have done in favor of the use of preservatives.

NATIONAL ASSOCIATION OF BOARDS OF PHARMACY AND THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES.

Report of Joint Committee on Arrangements and Proposed Program, Joint Conference at Indianapolis, Ind., in September, 1906.

Your committee appointed at the Atlantic City meeting of 1905 submits the following report which is published and distributed at this early date in order that all who are directly interested may have ample time to carefully consider the several propositions herewith submitted before the Joint Conference meets. Discussion and action at the Indianapolis meetings will thus be facilitated and rendered fruitful.

We believe that the harmonious co-operation of the Boards and Schools of Pharmacy in the promotion of sound progress and greater uniformity in the educational requirements for license to practice pharmacy, is universally desired. Such co-operation will surely benefit our ancient and honorable profession and elevate the position and services of the pharmacist to higher dignity and value.

Pending the amendment of existing laws in all States where amendment is necessary, the immediate object which it seems to us desirable to attain, if possible, should be the adoption of some definite and reasonably satisfactory general principles and minimum requirements which may be accepted by the great majority as entirely practical and practicable. These principles and minimum requirements should be applied in practice as rapidly as possible in all parts of our country where higher standards do not already obtain, in order that substantial progress toward improved conditions may be begun with a fair promise of success. The ultimate attainment of uniform standards should be held steadily in view.

Each Board and each School is asked to digest these propositions before the Indianapolis Conference takes place. But the pharmaceutical profession of the whole country is directly interested in these

matters and it is, therefore, believed that the American Pharmaceutical Association should be invited to aid us in our work. We have therefore requested the proper committee of the Association to give time upon the program of the Section on Education and Legislation for the consideration of these propositions, and that request has been granted.

After discussion in the Section on Education and Legislation of the American Pharmaceutical Association the propositions may be considered by the separate meetings of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties, respectively, should those bodies so decide.

Finally the Joint Conference of the Boards and Schools having had the advantage of full discussion and the advice of the American Pharmaceutical Association will then proceed with its business without being seriously handicapped by the limited time at its disposal.

In obedience to instructions we have prepared the following:—

PROGRAM OF PROPOSITIONS SUGGESTED FOR DISCUSSION AND ACTION.

(1) All laws and regulations governing the licensing of pharmacists should make due distinction between apprentices, clerks and principals, and should establish definite minimum qualifications and indicate the rights and duties of each of these three classes of pharmaceutical workers.

(2) The age of seventeen years and a preliminary general education of one year's satisfactorily completed high school work, or its full educational equivalent, should be the minimum prerequisites to the practical pharmaceutical experience or apprenticeship demanded by the laws, and no drugstore experience acquired at an earlier age or before the attainment of the preliminary education prescribed should be accepted as sufficiently effective to satisfy the intent of the law.

[The adoption of this rule does not prevent the employment of children under seventeen years or with less than one year's high school education in drugstores, it only prevents the recognition or acceptance of their employment as legally admissible evidence of fit preparation for license to practice pharmacy.]

(3) The age and preliminary general education prescribed for legally sufficient drugstore training should also be minimum prerequisites for admission to schools of pharmacy.

(4) Special education for the practice of pharmacy is in this age a necessity and should as rapidly as possible be made compulsory, and the rules of the Boards of Pharmacy should be such as to promote and encourage it in all practicable ways.

The special pharmaceutical education required should include substantial laboratory courses.

(5) Persons who have not given sufficient time and attention to the study of the subjects included in the Board examinations in pharmacy should not be admitted to said examinations. All applicants for admission to such examinations should be required to submit proper evidence that they have satisfactorily completed systematic courses of study in the subjects upon which they are to be examined, which subjects should be named and described in public announcements issued by the Boards.

(6) A Syllabus of Pharmacy Examinations should be prepared by a Committee of this Conference which shall indicate the subjects to be included in the Board examinations as well as in the courses of instruction in the pharmaceutical schools with a view to the attainment of a reasonably uniform standard of minimum requirements which may be adapted by all Boards and Schools.

(7) A national Committee on Examination Questions should be appointed by the National Association of Boards of Pharmacy, which committee should consist of —— members including experienced specialists in the subjects mentioned in the Syllabus of Pharmacy Examinations, who shall, under the direction of the said Association, prepare questions suitable for the examinations to be held by such State Boards of Pharmacy as may avail themselves of the services of said Committee.

(8) Definite and uniform conditions of efficiency should be adopted which all pharmaceutical schools must comply with in order to receive recognition by the Boards of Pharmacy in all cases where students and graduates of such schools receive credit in any form for the courses they have completed or for the time of attendance at such schools, these conditions of efficiency to be made public and to be applied equally to all schools.

The conditions of efficiency prescribed for the recognition of schools of pharmacy should relate solely to matters directly affecting the character of their educational work.

(9) In the determination of the fitness of any applicant to receive a license to practice pharmacy all important facts of his educational history, practical experience and technical services should be taken into account, including his preliminary general education, his special education in pharmaceutical and other related technical schools, his practical experience in pharmacy and the results of the examinations he has passed, and an average of these several factors, each assigned its appropriate value, should be adopted as the passing grade. Substantial credit should be given each candidate for any satisfactorily completed courses of education in pharmaceutical schools according to their extent and character.

(10) Graduates of Schools of Pharmacy registered by the Boards as fulfilling the prescribed conditions of efficiency should be exempt from the Board examinations, except in prescription reading and dispensing, upon presentation of satisfactory evidence that they have successfully completed systematic courses of instruction in such schools extending through two school years of not less than eight months each with not less than twenty-five hours instruction weekly of which not less than sixteen hours shall be laboratory work, the evidence of their graduation being accepted as a sufficient equivalent to the passing of the Board examination, provided all other legal requirements for license shall be fulfilled, and provided further the candidate shall have had two years high-school education; but no person should be granted a license to practice phar-

macy unless he shall have successfully passed a practical examination in the proper reading of prescriptions and the art of dispensing.

(11) No person should be licensed as a pharmacist or given the right to conduct a pharmacy on his own account, or as manager, who has not reached the age of legal responsibility.

(12) The laws and the rules of the Boards of Pharmacy should be so framed and construed as to require sufficient practical experience in pharmacies independently of courses of study, but to the end that substantial courses in the pharmaceutical schools may not be discouraged the laws and the Board rulings should not require persons who take longer courses to wait a correspondingly longer time before they are enabled to secure their licenses. The minimum total period prescribed for both college education and practical experience in pharmacies should, therefore, be the same for all persons without reference to the length of the college courses they may have completed, and should be sufficient to include a full two years' course in a pharmaceutical school.

(13) We recommend to all concerned that the foregoing principles and standards be adhered to in any amendments to the pharmacy laws hereafter proposed in order that national uniformity may be ultimately attained. The minimum requirements indicated, and especially the preliminary general education, should be increased from time to time as circumstances permit.

I. A. KEITH,
GEORGE B. KAUFFMAN,
Z. B. HOPKINS,
F. B. LILLIE,
OSCAR OLDBERG, *Chairman*.

THE PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The *third* stated meeting of this branch was held on the evening of Monday, May 21st, and was devoted to the discussion of "Self-Medication and the Evils of Counter-Prescribing."

Dr. Thomas R. Neilson, Clinical Professor of Genito-Urinary Diseases, University of Pennsylvania, opened the discussion by considering the "Limitations of Self-Medication," more particularly in connection with diseases of the genito-urinary tract. Dr. Neilson referred to the difficulty of making a proper diagnosis in many cases of venereal disorder, the ease with which the several diseases are communicated, and the incalculable amount of harm that has been, and is being, done by neglecting to safeguard the interests of the community in connection with diseases of this kind. Dr. Neilson thought that it was clearly within the province of the pharmacist to discourage the sale of the several nostrums that are advertised in

the daily papers, as specifics for venereal diseases, and to insist that the patient seek proper medical advice and supervision.

Dr. W. M. L. Coplin, Director, Department of Public Health and Charities, Philadelphia, in discussing "Counter-Prescribing and its Relation to Public Health," said that his department was of course primarily interested in the prevention of communicable diseases, as defined by the statutes under which the department had been inaugurated and was now working. He related several specific instances that had led him to make some inquiry as to who was responsible for the prosecution of the guilty parties and also read an opinion from the office of the City Solicitor which had induced him to inaugurate an active campaign for the elimination of irregular practices in connection with the several communicable diseases.

Dr. Coplin then recounted the method of procedure that it is proposed to follow and said that while there will be absolutely no tendency to be unjust or unfair, the practices in connection with several drug stores, of which he had been informed, must be discontinued, because they were inimical to the public health.

Dr. Coplin further said that he felt assured of the support of the better class of pharmacists in the proposed crusade and that it would no doubt lead to a decided bettering of conditions, so far as the interests of the public itself was concerned.

Prof. Charles H. LaWall then spoke of "The Duty of the Pharmacist to Aid in the Elimination of Irregular Practices." Professor LaWall said that while it was true that the practice of counter-prescribing was largely confined to pharmacists who have held aloof from association work it was clearly the province of the better class of pharmacists to enter on a crusade of educating not alone the public but also the physician of the dangers and the risks that are involved in practices of this kind. Professor LaWall called attention to the evident desire of physicians to become better acquainted with the resources and the practices of the better class of pharmacists and advised the members to take advantage of the opportunity now offered and to endeavor to establish more friendly relations with members of the medical profession.

The question was further discussed by a number of the members and visitors present, all of whom appreciated the necessity of some active educational work along these lines.

M. I. WILBERT, *Secretary.*

THE AMERICAN MEDICAL ASSOCIATION.

FIFTY-SEVENTH ANNUAL SESSION.

The remarkably successful meeting of the American Medical Association, held in Boston, Mass., June 5 to 8, 1906, will long be remembered as being numerically the largest and scientifically the most important meeting of that Association in all of the 57 years of its existence.

For the pharmacist, particularly the pharmacist who is at all interested in the development of the professional side of his calling, this fifty-seventh annual session of the American Medical Association was of more than ordinary importance.

It is probable that never before, in the history of the American Medical Association, has the subject of pharmacy, and all that pertains to it, received such serious and such thorough consideration.

While matters relating to pharmacy are usually discussed almost exclusively in the Section on Pharmacology and Therapeutics, they were, this year, also discussed rather freely in the inaugural address of the president, Dr. Wm. J. Mayo, in the several meetings of the House of Delegates, in the meetings of the Section on Practice of Medicine, and even in connection with the Scientific Exhibition, where Mr. Lyman F. Kebler, of the Drug Laboratory, as the representative of Dr. Wiley, exhibited a large number of nostrums and fake proprietary medicines.

Proprietary medicines and nostrums, particularly those of the more objectionable class, received an unusual amount of attention. They were discussed by Dr. George Dock, Dr. Richard C. Cabot and Dr. A. Jacobi in the Section on Practice of Medicine and also by Dr. Solomon Solis Cohen and others in the Section on Pharmacology and Therapeutics. The several papers and the discussions that followed, were augmented, or supplemented, by the exhibition made under the auspices of the Drug Laboratory mentioned above, so that many of the attending physicians had the superfluity, or downright uselessness of the average proprietary compound impressed on them as it never was impressed before. The practical results of these several papers, and of the exhibition that was made in connection with the meeting will largely depend on whether or not the pharmacists of the country are willing and able, to take advantage of their opportunity, to introduce and popularize the official U. S. P. and N. F. preparations.

This is a subject that properly should be taken up and discussed at the meeting of the American Pharmaceutical Association, and also at the meetings of the several State and local societies during the coming year; suffice it to say that the physician has demonstated himself to be not alone willing, but even anxious to learn more of official or standard preparations and to tear himself away from the domineering influence of the nostrum maker.

While Boston itself and the several exhibitions, and incidental social features that were held in connection with the meeting of the American Medical Association, all offered attractions that served to detract from the attendance on the several section meetings, it must be said for the pharmacists who were in attendance, and particularly for the delegates of the American Pharmaceutical Association, that they were more than ordinarily faithful in their attendance at the meetings of the Section on Pharmacology. This faithfulness was largely due, no doubt, to the interesting programme that had been provided and in some respects also to the spirited discussions that followed the reading of many of the papers.

Space will not permit that we reproduce even the six-page programme of the section and we will therefore content ourselves with a simple enumeration of the papers that were more directly of interest to pharmacists, in the order in which they were read.

Even here we cannot do more than enumerate the titles and the reader is advised to peruse the several papers as they appear in the pages of *The Journal of the American Medical Association.*

The Chairman's address, by Thomas F. Reilly, New York City, contained much that is of immediate interest to the pharmacist, and the following papers and reports are all of more or less direct interest:

"The Pharmacology of Digitalis," by Robert A. Hatcher.

"The Pharmacology of Veratrum," by H. C. Wood, Jr.

"Palatable Medication," by H. B. Sheffield.

"Prescribing versus Dispensing," by M. Howard Fussell.

"The Coming Revision of the U.S.P.," by M. I. Wilbert.

"The National Formulary," by C. Lewis Diehl.

"Nostrums and Fraudulent Schemes for Exploiting Them," by Lyman F. Kebler.

"The Limit of Proprietorship in Materia Medica," by S. Solis Cohen.

Report by the Secretary, C. S. N. Hallberg.

"The External Preparations of the U.S.P.," by C. S. N. Hallberg.

These several reports and communications were further supplemented by the following report, made by the Committee on Resolutions, that appears to embody the spirit of the several meetings to such a degree that we take the space to reproduce it in its entirety. The report not alone met with a favorable reception, but was also unanimously adopted and referred to the Board of Trustees of the American Medical Association for their consideration and further action.

(1) The Section of Pharmacology and Therapeutics of the American Medical Association welcomes every endeavor to advance the status of pharmacy as a learned profession, and expresses its full sympathy with the efforts of the American Pharmaceutical Association in this direction. The pharmacist, whether he be a dispenser or a manufacturer, must work hand-in-hand with the physician to consummate the results so urgently desired by both. We recognize that physicians as prescribers must rely upon the fidelity of the pharmacist and of the pharmaceutical manufacturer. Therefore it is highly desirable that more cordial relations and more thorough understanding should be fostered between both professions in order that the limits of legitimate pharmaceutical manufacturing may be more clearly defined.

We believe in regard to pharmaceutical preparations that secrecy concerning any substance possessing the slightest physiologic activity is improper and intolerable. The doctor has a right, and it is his duty, to insist upon the most complete and exact information obtainable concerning the active agents which exist in any preparation he uses.

We deprecate fanciful and inaccurate trade-names and titles, and recommend a more rational and scientific nomenclature in the naming of pharmaceutical preparations and products. We believe that by a system of process patenting a closer approach to ideal conditions can be reached and that it would obviate many of the present features of the pharmaceutical industry to which just objection has been taken. Such tangible protection as is necessary can be given in most instances by the addition of the manufacturer's name to the proper and intelligible title of the pharmaceutical product, thus insuring a recognized grade of accuracy and quality.

(2) The Section believes that the Council of Pharmacy and Chemistry can do much to bring about this desirable state of affairs; and, to the end that its work may be broadened and the results become of as great benefit as possible to the medical profession whose interests it must primarily serve, the Section earnestly recommends that a larger representation be given to clinical therapeutics by the election annually from the working membership of this Section of two members of the Council to serve for one year.

(3) The Section is heartily in favor of and strongly urges the establishment of a National Department of Health, with representation in the Cabinet.

(4) The Section learns with regret that certain manufacturing pharmacists have practically placed the facilities of their plants at the disposal of vendors

of some of the worst and vilest nostrums by which the people of the United States have been defrauded. It is obvious that such practices cannot be too severely condemned, especially if the patronage and confidence of the medical profession is to be retained.

(5) The Section strongly condemns the revolting evils which have been shown to exist in regard to foods and food supplies, especially the meat-packing industry. In the fundamental interests of the people such evils must be controlled by appropriate and adequate legislation, which we strongly urge as a paramount duty of our National Congress.

In connection with the question we wish to emphasize the fact that antiseptics and preservatives cannot mitigate in any degree the dangers from decayed or decaying meat. Antiseptics may destroy putrefactive organisms, but they cannot neutralize toxines or ptomaines. Any contention to the contrary is unsound, and meat that requires such treatment is totally unfit for food, inasmuch as it still contains poisons of virulent and dangerous character.

(6) The Section notes with regret, in examining the commercial exhibit, that the degree of selection which the members of the Association have a right to expect and demand has not been exercised. As a prevention of further abuse in this direction, at future meetings we would recommend that all pharmaceuticals be indiscriminately excluded from the commercial exhibit, or that provisions be made for a committee on exhibit from this Section, which committee shall be empowered to exercise full supervision in the matter and co-operate with the local committee.

H. EDWIN LEWIS, New York,
S. SOLIS COHEN, Philadelphia,
HEINRICH STERN, New York,
Committee.

Prominent among the attending pharmacists was Prof. Henry P. Hynson, of Baltimore, the chairman of the delegation from the American Pharmaceutical Association, who extended the hearty felicitations of that association and was also ever on the alert to defend the pharmacist, his vocation and his rights, whenever occasion offered.

Among other members of the American Pharmaceutical Association who attended the meetings of the Section on Pharmacology and Therapeutics were: C. S. N. Hallberg and W. A. Puckner, Chicago; C. Lewis Diehl, Louisville; Charles Caspari, Jr., Baltimore; Lyman F. Kebler and Reid Hunt, Washington, D.C.; Robert A. Hatcher, Thomas P. Cook and Caswell A. Mayo, New York; Wm. Wescott, Atlantic City; S. A. D. Sheppard and Professor Scoville, Boston; and Prof. S. P. Sadtler and M. I. Wilbert, Philadelphia.

The officers of the Section on Pharmacology and Therapeutics for the coming year are: Dr. H. C. Wood, Jr., Philadelphia, chairman; Dr. Henry R. Slack, Atlanta, Ga., vice-chairman; Dr. C. S. N.

Hallberg, Chicago, secretary; and Dr. S. Solis Cohen, Philadelphia, delegate.

Dr. Joseph D. Bryant, New York, was elected as the coming president of the Association, and Atlantic City was unanimously selected as the meeting place for the fifty-eighth annual session to be held in 1907.

M. I. WILBERT.

ALUMNI ASSOCIATION, PHILADELPHIA COLLEGE OF PHARMACY.

The Forty-second Annual Meeting of the Alumni Association of the Philadelphia College of Pharmacy was held on Monday afternoon, May 14, 1906, in Alumni Hall, President F. P. Stroup presiding.

The reports of the officials of the Association for the year 1905–06 were read, and appropriate action taken.

The following officials were elected for the ensuing year: President, John D. Burg, '86; First Vice-President, Charles H. LaWall, '93; Second Vice-President, E. Fullerton Cook, '00; Recording Secretary, Joseph W. England, '83; Treasurer, C. Carroll Meyer, '73; and Corresponding Secretary, Clarence H. Campbell, '90.

The following were elected members of the Board of Directors (to serve four years): Henry C. Blair, '92; George B. Weidemann, '02; Lucien S. Kemp, '99; Lorne E. Hastings, '04.

The following were elected to honorary membership: Nicholas H. Martin, of New Castle-on-Tyne, England; P. C. Candidus, Mobile, Ala.; Dr. J. A. Miller, Harrisburg, Pa.; John F. Patton, York, Pa.

J. W. ENGLAND,
Secretary.

PHARMACEUTICAL MEETINGS.

The regular monthly Pharmaceutical Meeting of the Philadelphia College of Pharmacy was held on Tuesday afternoon, April 17th, with J. C. Peacock, a local pharmacist and chemist, and member of the College, in the chair.

M. I. Wilbert, Ph.M., apothecary at the German Hospital, Philadelphia, was the speaker of the afternoon, and gave an address on

"Benjamin Franklin and His Influence on the Progress of Medicine and Pharmacy in America." (See page 214.)

In discussing the address Mr. Thomas S. Wiegand, librarian of the College, called attention to the fact that Benjamin Franklin was the first secretary of the Pennsylvania Hospital and that the present incumbent of that office is James T. Shinn, treasurer of the Philadelphia College of Pharmacy. Dr. C. A. Weidemann called attention to the bust of Franklin in the Museum of the College, and wondered how long it had been in the possession of the College, saying that to his knowledge it had been in the Institution at least forty years. Prof. Henry Kraemer referred briefly to the career of Franklin, and said that one phase of his genius seemed to consist in his being entirely himself. Prof. C. B. Lowe and Mr. E. M. Boring also took part in the discussion.

Some matters relating to practical pharmacy were presented, but these will be considered more in detail at the next meeting.

The last of the series of pharmaceutical meetings of the Philadelphia College of Pharmacy for 1905–06 was held on Tuesday afternoon, May 15th, M. I. Wilbert, Ph.M., presiding.

William G. Toplis, a pharmacist of Germantown (Philadelphia), was the first speaker and presented two communications, one on "The Pasting of Labels on Tin," and another on "Aromatic Elixir." (See page 332.)

In commenting upon the proposed formula for aromatic elixir, Mr. Wilbert said that instead of passing the distilled water through the filter it would be better to add it afterward, that is, to the finished product, for the reason that the oil would be less likely to be thrown out of solution, particularly in cold weather.

Prof. C. B. Lowe said that one of the simplest ways of applying labels to tin is to roughen the surface of the tin with sand-paper; another method is to apply tincture of benzoin to the tin; and a third way is to add hydrochloric acid to the paste. Professor Lowe then made some remarks on practical pharmaceutical subjects. He said that in making suppositories he preferred the use of a machine for forcing out the suppositories from the mold. He finds that a piece of paper placed over the ice used for cooling the mold not only helps to hold the mold in place but in the case of the divided mold prevents water from entering the mold. Dr. C.

A. Weidemann suggested the use of a pan with a flange for holding the suppository mold in place while being cooled. He thought that one trouble in the making of suppositories consists in allowing the liquid to become too thin before pouring it into the mold. He considered that dusting the mold with lycopodium is an advantage. Dr. Lowe said that some object to the use of lycopodium, but that he saw no objection to its use. He said that it is very important to know just when to add the mass to the liquid cacao, for if the liquid is too hot the medicament will be unevenly distributed. Mr. Wilbert said that he preferred the method of cold compression in the making of suppositories. He thought that the fact that many large manufacturers make them in this way is proof of the superiority of the method. He said that by the use of sufficient force a smooth suppository would result. Mr. Wilbert further said that he had given up grating the cacao butter years ago, and that he had found a meat cutter to be useful for comminuting the cacao butter and also for chopping up certain drugs, and in other ways. In making suppositories by cold compression Mr. E. M. Boring suggested the addition of a trace of lard to the mass and afterward placing the suppositories in a mold for shaping and finishing them. Mr. Toplis approved of the latter method. Mr. J. W. England favored the method of cold compression and shaving the cacao butter in the manner suggested by Mr. Wilbert. Dr. O. W. Osterlund said that he uses a grater for dividing the cacao butter, and a Whitall-Tatum machine of small capacity for molding the suppositories. He said that with this machine he could make three or four suppositories at one time, and that he experienced no more difficulty in making suppositories than in making powders. Mr. Ambrose Hunsberger said that he had been informed that in Scotland it is customary for pharmacists to send prescriptions for suppositories to a suppository maker who is a specialist in this line.

In the making of solutions of argyrol Dr. Lowe recommended first coating the mortar with glycerin so as to prevent the solution from sticking to it. Mr. Wilbert said that the addition of glycerin to the solution of argyrol in the manner suggested is objectionable for the reason that the solution is frequently used as an eye solution. He said that in making eye solutions it is important to avoid contamination as much as possible, and therefore preferred making the solution in the bottle in which it is to be dispensed. Mr. Boring

said that for compounding medicines of this character he keeps on hand small bottles of water which have been sterilized.

Professor Lowe exhibited a label or tag which he attaches to packages sent out to customers and which he has found of advantage in keeping a record of money collected on delivery. The label consists of two parts, one to be retained by the customer, showing whether the purchase has been charged, paid for, or is to be collected, and one to be returned to the store, giving the name of the customer, the amount collected and the amount of change.

Mr. Boring also presented some items of practical interest. He said that the process of powdering balm of Gilead buds is materially assisted by the use of purified talcum. Referring to the fact that official alum is potash alum, Mr. Boring spoke of the repeated attempts which he had to make to obtain this particular salt, the dealer supplying him having furnished ammonia alum instead. In commenting on a prescription which directed the making of 40 grains of extract of ergot, 10 grains of extract of belladonna and 1 grain of strychnin sulphate into 40 pills, Mr. Boring said that the use of a vegetable powder gave too large a pill, but that the use of about 20 grains of spermaceti gave a pill of desirable size and consistency.

Joseph W. England read a paper on "Syrup of Wild Cherry, U. S. P. 1900," (see p. 267).

Mr. Wilbert said that there is some difference of opinion as to the use of syrup of wild cherry. By some physicians it is used as a vehicle only, in which case a thin syrup is better. He also said that a thin syrup or one made without glycerin is more economical, and for this reason he had been omitting the glycerin and replacing it with sugar for some time.

Mr. England was inclined to the view that the therapeutic activity of the preparation is due to hydrocyanic acid and bitter principle, and said that if this be granted, then the strength has been cut down very materially. Mr. Boring recommended placing a pad of cheese cloth in the bottom of the percolator used in extracting the powdered bark. He said that cheese cloth is preferable to sponge, cotton flannel or cotton, and is also useful in making plain syrup if care be taken not to jar the contents of the percolator. Mr. Toplis said that the whole secret of the process of making syrup by percolation lies in providing sufficient drainage, and recommended placing some coarse material in the bottom of the percolator. He said that he

makes syrup for soda water by percolation and that the yield is 5 gallons in 24 hours. Mr. Wilbert said that he uses a pad of cotton which is drawn down through the neck of the percolator and some distance below the mouth, thus setting up capillary attraction, and thereby hastening the operation.

Prof. Henry Kraemer exhibited 25 samples of crude drugs derived from plants grown by the U. S. Department of Agriculture. He said that the College has a complete set of the vegetable drugs thus far produced by the Department and remarked that these specimens are not only useful as type specimens, but that in time to come they will have a historical value.

Professor Kraemer, Philadelphia member of the Committee on Procter Monument of the American Pharmaceutical Association, called attention to the circular letter (see page 285) which has been issued by the association bearing on this subject, and referred briefly to the inception of the movement to thus honor Professor Procter. He stated that the Committee are now inaugurating an active campaign for the collection of funds, and said that he was ready to receive subscriptions to the monument fund. Professor Kraemer said the amount which the committee desires to collect is $25,000 and that he had no doubt this sum would be raised.

Mr. Wilbert said that the subject was an opportune one. He said that it was here in Philadelphia where Procter labored morning, noon and night, and that Philadelphia druggists should seize this opportunity of honoring his memory, for in honoring him they would not only be honoring themselves, but would help in showing to future generations what pharmacy has been.

Several subscriptions were received at the close of the meeting.

FLORENCE YAPLE,
Secretary pro tem.

NOTES AND NEWS.

THE PROCEEDINGS OF THE A. PH. A. at the fifty-third annual meeting, held at Atlantic City, N. J., September, 1905, has just been issued. The frontispiece is an excellent portrait of the late Prof. Albert B. Prescott, who was the President of the Association in 1899–1900. When one looks over the proceedings and sees the amount of original and useful information as embodied in the papers, discussions, reports (including the one on "Progress in Pharmacy"), it is difficult to understand why more retail pharmacists are not members of the Association. It would seem as though with the efforts which are being made to raise the status of the colleges of pharmacy in the United States, the graduates of the various schools would furnish the recruits of the Association. Either the Association should reach these men or they should be taught the value of membership in the Association as illustrated in the proceedings.

THE NATIONAL FORMULARY of Unofficial Preparations (third edition) will shortly be ready for delivery. A considerable number of new formulas have been introduced into the new edition and all formulas of the previous edition have been carefully revised and corrected in accordance with satisfactory results obtained after due investigation, and it is confidently believed that as now given they will prove entirely satisfactory. All formulas dismissed from the 1900 Pharmacopœia, about eighty-four in number, together with thirty obsolete U.S.P. formulas carried in the general text of the Formulary heretofore, have been transferred to the "Appendix."

The National Formulary will be issued at the following prices:

Cloth, plain, $1.00 per copy; cloth, interleaved, $1.25 per copy; sheep, plain, $1.35 per copy; sheep, interleaved, $1.50 per copy. Special discounts will be allowed to dealers and others buying in similar quantities. Delivery of all orders will be prepaid by the Association and will be made strictly in the sequence in which the orders are received. All orders for the National Formulary should be addressed to the General Secretary of the American Pharmaceutical Association, Charles Caspari, Jr., Department of Pharmacy, University of Maryland, Baltimore, Md. Remittances should be made in cash by registered mail, or by P. O. Money Order or New York Exchange. Local checks require collection fee, and should not be sent.

DR. EDWARD KREMERS delivered an address entitled "The College of Pharmacy" at the commencement exercises of the University of Illinois School of Pharmacy. The address has appeared in a number of pharmaceutical journals and is of considerable historical interest as showing the evolution of the colleges of pharmacy, while at the same time pointing out their trend at the present time.

PROF. JOHN URI LLOYD, who is now travelling in the Orient, was in Smyrna early in May. Professor Lloyd is communicating a series of interesting letters on his travels to the *Electic Medical Journal*, the first appearing in the May issue and giving an account of his trip to the Azores.

THE MISSOURI PHARMACEUTICAL ASSOCIATION held its twenty-eighth annual meeting at Pertle Springs, June 12-15. Ninety members, fifty salesmen and about one hundred and fifty visitors were present. President J. F. Llewellyn's

address contained reminiscences of the early experiences of this veteran pharmacist, who, half a century ago, was an assistant in the factory of Dr. Edward Squibb.

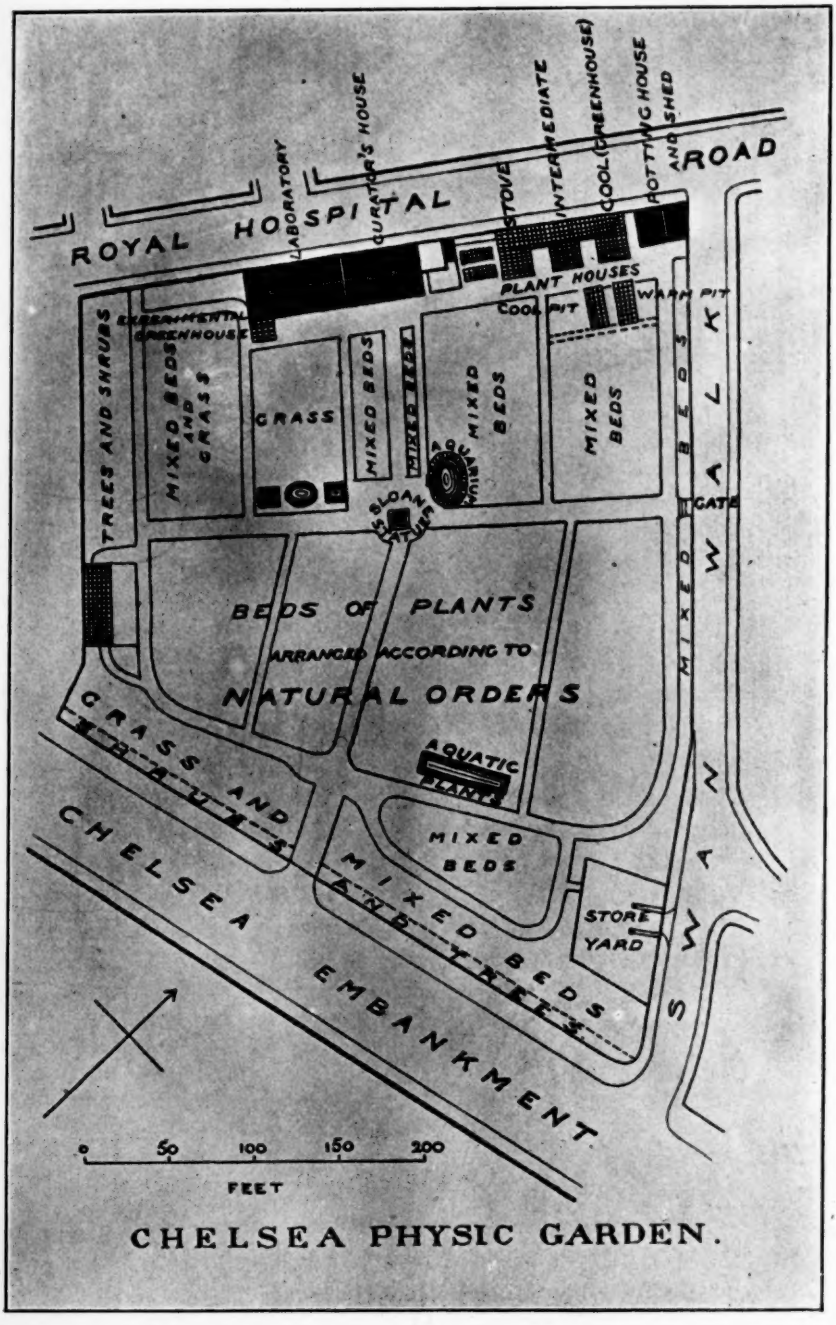
The William Procter, Jr., Memorial Fund (Dr. Otto F. Claus, Chairman) was subscribed to by many members.

The Committee on Drug Adulterations (Dr. Charles E. Caspari, Chairman) reported on a large number of examinations and stated that as a rule the medicines in Missouri answer the requirements of the U.S.P.

The new officers are: President, L. A. Seitz, St. Louis; First Vice-President, J. V. Murray, Warrensburg; Second Vice-President, Louis Grother, Cole Camp; Third Vice-President, Fred Pierce, Nevada; Treasurer, William Mittelbach, Boonville; Permanent Secretary, Dr. H. M. Whelpley; Assistant Secretary, Otis W. Smith, Sedalia. Council: J. F. Llewellyn (Chairman), Mexico; W. E. Bard, Sedalia; Dr. Otto F. Claus, St. Louis; Paul L. Hess (Vice-Chairman), Kansas City; Ed. G. Schroers, St. Joseph.

AMERICAN PHARMACEUTICAL ASSOCIATION.—As was stated in the June issue of this Journal, the Procter Monument Fund Committee of the American Pharmaceutical Association have begun to solicit subscriptions to the Fund in a systematic manner. In response to circular letters sent out about the middle of June Prof. Henry Kraemer has received to date subscriptions amounting to $415, of which $138 are in cash. The following is a list of subscribers, together with the amount subscribed by each:

J. B. Moore	$ 25 00	J. H. Stein	$ 5 00
J. C. Peacock	5 00	Joseph A. Heintzelman	10 00
Lorne E. Hastings	2 00	Florence Yaple	5 00
Edwin L. Newcomb	5 00	William R. Warner, Jr.	50 00
Henry P. Thorn	5 00	Henry Kraemer	10 00
Ambrose Hunsberger	5 00	J. Warren Worthington	2 00
Joseph P. Remington	100 00	William J. Miller	3 00
Edward H. Hance	10 00	O. W. Osterlund	5 00
M. I. Wilbert	5 00	Adolph W. Miller	15 00
L. E. Sayre	2 00	Harry Matusow	2 00
James T. Shinn	10 00	Evan T. Ellis	10 00
Richard M. Shoemaker	15 00	William M. Morrison	5 00
Wm. O. Frailey	1 00	John F. Patton	5 00
Louis Emanuel	5 00	Mahlon N. Kline	25 00
Smith, Kline & French Co.	50 00	Joseph W. England	5 00
J. M. Graves	2 00	John K. Garland	1 00
David Horn, Jr.	5 00	S. E. R. Hassinger	5 00



PLAN OF CHELSEA PHYSIC GARDEN, IN 1905.
(Royal Hospital Road was known, until recently, as Queen's Road)

NOTE.—*The plant houses are indicated by crossed lines, the other buildings by black areas.*